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MARKETING BHUTAN'S POTATOES

PRESENT PATTERNS and FUTURE PROSPECTS

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FRONT COVER—Retailing table potatoes in Sunday market, Paro, Bhutan.

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A POTATO MARKETING/DEMAND CASE STUDY

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PREFACE

At request of the National Potato Program and the Department of Agriculture (DOA) in Bhutan, a potato marketing specialist from the International Potato Center (CIP), Lima, Peru, surveyed India, Bangladesh and Bhutan from October 14 to November 18, 1982, using these terms of reference:

- Provide a descriptive analysis of existing foreign and domestic marketing patterns for Bhutanese potatoes.
- Assess future demand for table and seed potatoes produced by Bhutan with special emphasis on marketing high quality seed potatoes abroad.
- Formulate a list of recommendations to develop markets for Bhutanese potatoes both abroad and at home.
- Prepare a comprehensive report containing results of field work and associated recommendations.

During a 6-week trip around the sub-continent, the author visited potato marketing centers in Delhi, Calcutta, West Bengal, and Assam in India, metropolitan Dacca in Bangladesh, as well as 10 of Bhutan's 17 districts. In Bhutan, West Bengal, and Assam about 2,500 kilometers were covered by jeep to see and talk to potato marketing participants themselves.

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All photos are by the author unless otherwise acknowledged.

Currency Equivalents

(October-November 1982)

Currency Unit	=	Bhutanese Ngultrum (Nu)
Nu. 9.5*	=	US $ 1
Nu. 95*	=	US $10
100 Indian paise	=	Nu. 1
1 Indian Rupee (Rs.)	=	Nu. 1

*Approximate

Weights and Measures

Bhutanese System		Equivalent
1 kilometer (km)	=	.62 mile (mi)
1 acre	=	.4048 hectare (ha)
1 kilo (kg)	=	2.205 pounds (lb)
1 maund (md)	=	37.5 kilos (kg)
1 quintal (qq)	=	100 kilos (kg)
1 ton (t)	=	1000 (kg)/2,205 (lb)

Abbreviations and Terms

FCB	=	Food Corporation of Bhutan
DOA	=	Department of Agriculture
CIP	=	International Potato Center (Centro Internacional de la Papa)
S./Jongkhar	=	Samdrup Jongkhar (district capital)
Wangdi	=	Wangdi-Phorang (district or district capital, depends on context)
Godown	=	Simple, unrefrigerated warehouse
Cold store	=	Refrigerated storage facility

TABLE OF CONTENTS

	Page
Preface	(iii)
Currency Equivalents, Weights/Measures, Abbreviations	(iv)
Table of Contents	(v)
List of Tables	(vii)
List of Maps	(vii)
I. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	**1**
Introduction	1
1.1 Summary of Principal Findings	1
1.2 Conclusions and Recommendations	6
A. Market Promotion, Information, and Research	8
B. Market Infrastructure, Administration, and Personnel	8
C. Marketing Policy and Food Self-Sufficiency	9
II. ECONOMIC DEVELOPMENT AND POTATOES IN BHUTAN	**11**
Introduction	11
2.1 Economic Development in Bhutan: An Overview	11
(i) The New Policy of Modernization	11
(ii) Economic Dependence on India	11
(iii) Agriculture in the Bhutanese Economy	13
(iv) Agricultural Development: Goals and Strategies	15
(v) Constraints to Agricultural Development	15
2.2 Bhutanese Agricultural Development and Potatoes	16
2.3 Issues for this Study	18
2.4 Methodology Utilized for this Study	20
III. POTATO PRODUCTION AND CONSUMPTION IN BHUTAN	**21**
Introduction	21
3.1 Potato Production	21
(i) Agroecological Regions	21
(ii) Potato Production, Area, and Yields	23
(iii) Types of Potato Producers	24
(iv) Varieties Planted and Growing Season	25
(v) Farm-Level Production Constraints	27
3.2 Potato Consumption	28
(i) The Potato in the Bhutanese Diet	28
(ii) Levels of Potato Consumption by Region	28
(iii) Types of Consumers	29
(iv) Consumer Preferences	29
(v) Constraints to Increased Potato Consumption	30
IV. PREVAILING MARKETING PATTERNS FOR BHUTANESE POTATOES	**31**
Introduction	31
4.1 Marketing Patterns inside Bhutan for Table Potato and Common Seed Exports	31
(i) Western Hills Region	31
(ii) Eastern Hills Region	33
(iii) Southern Foothills Region	34
4.2 Marketing Patterns for Bhutanese Table Potato and Common Seed Exports in India	37
(i) Indian Potato Production and Bhutanese Potato Marketing	38
(ii) Marketing Patterns for Northern West Bengal	43
(iii) Marketing Patterns for Assam	46

4.3 Marketing Bhutanese Improved Potato Seed 47
(i) Marketing Bhutanese Improved Potato Seed inside Bhutan 47
(ii) Marketing Bhutanese Improved Potato Seed in India 49
4.4 Potato Retailing in Bhutan 51

V. GOVERNMENT INSTITUTIONS AND MARKETING POLICIES FOR BHUTANESE POTATOES 55
Introduction 55
5.1 The Food Corporation of Bhutan and Potato Marketing 55
(i) Support Price and Direct Purchase Program 56
(ii) Marketing Resources: Physical Infrastructure, Manpower, Capital 57
5.2 The Department of Agriculture and Potato Marketing 60
5.3 Marketing Policies that Affect Bhutanese Potatoes 61
(i) Price Policies 61
(ii) Market Controls 62
(iii) Export/Import Policies 63

VI. FUTURE PROSPECTS FOR BHUTANESE POTATO MARKETING 65
Introduction 65
6.1 Future Prospects for Bhutanese Potato Exports 65
(i) Table Potatoes 65
(ii) Common Seed 67
(iii) High Quality Seed 70
(iv) Third Country Potato Exports 70
(v) New Potato Export Products 71
6.2 Future Prospects for Domestic Potato Marketing 72
(i) Table Potatoes 72
(ii) Common Seed 73
(iii) High Quality Seed 73
6.3 Constraints to Bhutanese Potato Marketing 74
(i) Constraints to Bhutanese Potato Exports 74
(ii) Constraints to Domestic Potato Trade 77

References 78
List of Contacts 79

LIST OF TABLES

			Page
2.1	Bhutan	Value of exports and imports, 1978	13
2.2	Bhutan	Estimated Gross National Product at market prices, 1979-80	14
2.3	Bhutan	Government development expenditures, 1961-1986	14
2.4	Bhutan	Present and planned agricultural production	17
2.5	Bhutan	Estimated exports of cash crops by FCB, selected years	17
3.1	Bhutan	Estimated area planted, production, yields, marketable surplus for potatoes by agroecolocial region, 1981-82 crop year	24
3.2	Bhutan	Potato varieties planted by major growing center, 1982	26
3.3	Bhutan	Estimated potato consumption by location and region, 1982	29
4.1	India	Area under potatoes by states, 1963/64 to 1978/79	39
4.2	West Bengal	Area, production, and average yield of potatoes for selected years plus respective compound growth rates	40
4.3	Calcutta	Average monthly wholesale prices for potatoes, 1960-1980	41
4.4	West Bengal	Potato production in different districts, 1960/61 to 1978/79	42
4.5	West Bengal	Distribution of cold stores and their capacity by district, 1980	43
4.6	Siliguri	Timing of table potato shipments	46
5.1	Bhutan	FCB support price for potatoes, selected years	56
5.2	Bhutan	FCB potato purchases and exports for selected years	57
5.3	Bhutan	Location, capacity FCB potato godowns, 1980/81	58
5.4	Bhutan	Bhutan Food Corporation Organization Chart	59
5.5	Bhutan	FCB sales of quota rice—major depots	64
6.1	India	Retail potato prices in selected markets during 1981	66
6.2	West Bengal	Area under potato in different districts, 1960/61 to 1978/79	68
6.3	West Bengal	Average potato yields in different districts, 1960/61 to 1978/79	69
6.4	Bangladesh	Potato seed imports, selected years	71

LIST OF MAPS

		Page
1	Map of Bhutan and Adjoining Countries	12
2	Map of Bhutan with Districts Indicated	22

CHAPTER ONE

Summary, Conclusions, and Recommendations

Introduction

Bhutanese policy makers have proposed increased potato production and improved potato marketing as part of the current national Five-Year-Plan. While agroclimatic conditions in Bhutan make production increases technically possible, past potato marketing losses raise a key question: if Bhutan produces more potatoes, where will these potatoes be marketed? This report addresses this and related issues, based on field work in Bhutan and neighboring countries. This potato marketing study complements earlier research on potato production by Bharat Karmacharya, "National Potato Development Programme" (1981) and on potato consumption by Susan Poats, "Potato Consumption in the Kingdom of Bhutan" (1982).

Given the shortage of previous potato marketing studies, this report is directed at several types of readers. For those with a general interest in this topic, main points of the entire study are summarized below. Readers with a detailed interest in more specific issues are urged to consult succeeding chapters.

1.1 Summary of Principal Findings

Economic Development and Potatoes in Bhutan

Two key macroeconomic considerations influence the Bhutanese national potato program.

First, all development programs in Bhutan are considered in terms of the Kingdom's new policy of modernization. This policy is intended to promote greater Bhutanese interaction with the world community of nations and to increase domestic socioeconomic progress without altering the Kingdom's most admirable customs.

Second, an overwhelmingly agrarian Bhutanese economy is highly dependent on India. In particular, Bhutan relies on Indian supplies of farm inputs such as seed, fertilizer, and basic necessities including rice and cooking oil.

Potatoes are one of Bhutan's most important farm commodities. While most potatoes have been exported to India as a source of foreign income, a growing body of evidence suggests their present use and future potential as a food crop for domestic consumption has been seriously underestimated. Hence, greater potato production and marketing can help Bhutan meet two particular development goals: achieving food self-sufficiency and raising farmers' incomes.

Potato Production and Consumption in Bhutan

Potatoes are produced primarily in the Western and Eastern Hills regions of Bhutan. A relatively small quantity are grown in the Southern Foothills region. Different types of producers cultivate potatoes in the Kingdom: commercial growers, semi-

subsistence farmers, and kitchen gardeners. Commercial farmers in the Western and Eastern Hills grow most of the marketable surplus of potatoes. Production is about evenly divided between local varieties and imported hybrids. A main farm-level potato production constraint is shortage of improved, clean seed.

Until 1982, Bhutanese officials considered potatoes almost exclusively as a cash crop for export. Although rice is Bhutan's major staple, potatoes are eaten as a complement in a variety of dishes. Recent field work (Poats 1982), however, indicated not only a much higher level of actual potato consumption, but also considerable potential for even greater future use. One major constraint for increased potato consumption is a need for policy makers to consider the potato in food policy deliberations.

Marketing Patterns for Bhutanese Potatoes

(i) Table Potatoes and Common Seed

Bhutanese farmers market not only table potatoes at home and in India but also seed potatoes (common and high quality) for domestic and foreign use. Marketing patterns inside Bhutan for table potato and common seed exports have distinct regional characteristics. In the Western Hills region, most potatoes are transported to the border by producers themselves. Farmers prefer this type of marketing arrangement because they also need to buy provisions at the frontier. Most of these potatoes are sold for table use during August and September.

Potato producers in the Eastern Hills region sell their potatoes to local traders. Some of these traders provide advances in cash or kind to growers whom they trade with on a regular basis. Some producers harvest their potatoes in July and August for sale in October and November; others market their crop in August and September.

Most Bhutanese potato exports go through Phuntsholing. Potato trade there recently has been reorganized into an auction yard regulated by the Food Corporation of Bhutan (FCB). Phuntsholing traders pay cash for various small lots of Bhutanese potatoes and then resell them on credit to commission agents in India. Phuntsholing merchants prefer red-skinned varieties to white-skinned potatoes and a small, oval tuber to a large round one.[1] During 1982, these traders paid 20% to 30% more per hundred weight for red-skinned potatoes.

Potatoes exported from the Eastern Hills go through Galeyphug and S./Jongkhar. Galeyphug merchants handle limited quantities of Bhutanese exports. Generally they sell on credit to merchants in India or local vegetable vendors. S./Jongkhar traders handle both table potatoes and common seed. They pay cash to growers and rural assemblers and frequently sell re-graded potatoes out of their godowns across the river in India. Galeyphug and S./Jongkhar traders both prefer to buy small, oval, white-skinned potatoes. Most Bhutanese potato exports to India are marketed in northern West Bengal and Assam. Bhutanese potatoes can compete in these markets for two reasons: First, their distinctive taste is preferred by Indian consumers in this region; second, they are sold principally from mid-August to mid-October when few local fresh potatoes are available.

[1] A "small" potato in this region is 6-8 cm. in length and 4-6 cm. in width.

Several factors have more favorably influenced demand for both Bhutanese table potatoes and common seed in northern West Bengal. Demand for table potatoes has been spurred by a growing seasonal shortage of fresh potatoes in northern West Bengal. Similarly, demand for Bhutanese common seed has been boosted by the spectacular growth in area planted in potatoes, among other reasons. Fewer Bhutanese potatoes are shipped to Assam largely because Assam is nearer the hilly areas of eastern India that also sell fresh potatoes at this time.

(ii) Improved Seed Potatoes

Bhutanese farmers also produce improved seed potatoes both for domestic sale and export. The Department of Agriculture (DOA) reports distributing some 600 tons of improved healthy seed to Bhutanese growers every year. District agricultural officers produce some of this improved seed themselves. They also order improved seed from government farms. One problem with the existing seed distribution system is matching district agricultural officers' requests for red-skinned varieties with the white-skinned potatoes grown on government farms. Farmers believe that higher prices for red-skinned potatoes more than than compensate for their lower yields. This issue needs to be studied.

During the last 2 years, government farms and a small number of registered growers also have produced about 250 tons of high quality seed, primarily for export. Since table potato prices have been quite good the last two seasons, however, Bhutanese officials have had trouble making local registered growers abide by the contract. As a result, government farms have used most of their high quality seed to meet contractual commitments and little has been left for sale to local growers.

(iii) Potato Retailing

Potatoes are marketed retail in the major towns and administrative centers around the Kingdom, particularly in the Western Hills and Southern Foothills regions. Retail potato sales usually take place either in village shops or at local Sunday fairs. During the Bhutanese potato harvest, shopowners buy potatoes from area farmers a sack or two at a time, for cash or on a barter basis. Some small merchants also sell potatoes that they produced on their own farms. From December to March, highland shopkeepers and border town produce vendors import cheap Indian potatoes. Retail shopowners in the hills usually buy their Indian potatoes from traders in Phuntsholing, Galeyphug or S./Jongkhar.

Retailers sell potatoes to government employees, foreign laborers or Indian army personnel. Bhutanese farmers rarely buy potatoes to eat. Retail potato sales almost always are for cash. Gross revenues average about 50 *paise* per kilogram on a selling price of 1.5 to 2 *Nu.* per kilogram. Shrinkage losses and transport costs appear to account for this relatively high mark-up.

Government Institutions and Marketing Policies

Government institutions and marketing policies have a major impact on potato marketing in Bhutan where development plans frequently call for direct government intervention. The dilemma inherent in such a strategy is how to balance the cost of centrally planned programs intended to meet the government's socioeconomic responsibilities against available public resources and the

need to encourage local individual initiative.

The two most prominent government institutions that influence Bhutanese potato marketing are the FCB and the DOA. The FCB's potato marketing activities are confined to table potatoes. These activities include a support price/direct purchase program and the recently established auction yard in Phuntsholing. Past losses in the support price program helped create serious financial problems for the FCB. In the short-run, these problems have been assuaged by favorable market conditions for potatoes and consequently the growers reluctance to sell to the FCB at the support price. In the longer run, various proposals are under consideration to place the FCB on sounder financial footing. Manpower problems continue to hamper the FCB's potato marketing operations.

The DOA handles seed potato marketing, in particular the export program for high quality seed. Contract negotiations and program financing for high quality seed exports are largely the responsibility of a veteran, expatriate civil servant. Operating procedures have been informal and pragmatic. Manpower problems and, to a lesser extent, program financing, have restricted the DOA's ability to do detailed marketing research and cost accounting.

Various government policies influence Bhutanese potato marketing, e.g. support price, market control, and export/import policies. This ambitious set of well-intentioned initiatives raises several concerns. For example, they have been implemented without detailed annual estimates of costs and returns. Government marketing controls have insured only legitimate merchants participate in the FCB auction. However, they also have restricted entry to the current small group of traders. Because potatoes have been classified as an export crop, official interest in initiatives to expand the domestic market for Bhutanese potatoes has been limited.

Future Prospects for Bhutanese Potato Marketing

In the years ahead, Bhutan is expected to expand potato production and marketing. It is impossible to predict the exact quantities that Bhutan can profitably sell because of limited statistics and numerous contributing factors. Increases in potato production in India is one major unknown beyond Bhutan's influence. Nevertheless, several critical components are in Bhutanese hands. As a general observation, the Bhutanese must secure a reliable source of improved seed for multiplication and distribution in Bhutan. Without such seed, the entire potato development program is severely handicapped.

(i) Potato Exports

The Bhutanese can also strongly influence their foreign potato marketing prospects by: (a) increasing productivity, improving quality and lowering unit production costs, and, (b) expanding efforts to secure existing outlets and to capture new ones. The author envisions that Bhutan will continue to export mostly table potatoes to northern West Bengal and Assam. More distant markets in Calcutta, Delhi, and Bombay are less likely future outlets because, among other reasons, transportation costs make Bhutanese potatoes prohibitively expensive.

Consequently, assuming that Bhutan exported roughly 5,000 tons of table potatoes during 1982, this quantity seems a reasonable target for the years ahead. In other words,

as potato production increases, Bhutan should probably become less dependent on table potato exports. More aggressive commercial farmers probably will switch some of their ware production for export into improved common and/or high quality seed. Small, semi-subsistence growers probably will sell their growing marketable surpluses of table potatoes in local towns.

As long as Bhutan exports potatoes, it seems certain that some of these potatoes will be sold as common seed. Again, the principal export markets for common seed will be northern West Bengal and Assam. While such factors as a further expansion in area planted in potatoes in West Bengal favor increased demand for Bhutanese common seed, occasional bumper crops in India and increases in potato productivity in places such as Shillong will dampen demand. Bearing these conflicting developments in mind, the author estimates that Bhutan's annual exports of common seed could reach 1,000 tons in the next 5 years.

Bhutan's future exports of high quality seed should also increase. Still, the principal market for this seed will continue to be northern West Bengal and Assam. The volume of high quality seed exported will be influenced by several unknowns. Final seed standards established by the Bhutanese national program and the resulting production costs per kilo is one such unknown. The ratio of prices to productivity for Bhutanese high quality seed versus rival Indian products is another unknown. Weighing these and other considerations, the author estimates that Bhutan could export 1,000 tons of high quality seed per year by the end of the current Five-Year-Plan.

Increased Third country exports of Bhutanese table potatoes or high quality seed are not likely in the near future. Bhutan is still negotiating a new trade agreement with India that would allow rail or river shipments direct to northern Bangladesh via Assam. Bhutanese potato exports to Sri Lanka or Burma seem even more improbable. Sri Lanka has stopped importing potatoes. Transport costs are a formidable handicap in any event. While some Bhutanese common seed apparently goes to eastern Nepal via Siliguri, this trade appears to be limited. Bhutan has no official trade agreement with Nepal that would facilitate official potato shipments.

Bhutanese national potato program officials are also exploring export prospects for new potato products such as bakery starch and foundation seed. Although prospective buyers for bakery starch have shown interest in this product, it has yet to be perfected. Hence, its economic viability remains promising, but largely uncertain. Export of foundation seed merits closer examination from a marketing strategy perspective. Successful export of foundation seed may earn additional income for some farmers. But, it may also eliminate the market for certified and common seed as well. As a general guideline, Bhutan should strive to multiply foundation seed or basic seed inside the Kingdom and export nothing more sophisticated than certified seed or its local equivalent. In other words, top priority should be given to improving seed potatoes for distribution to Bhutanese growers and not to earning additional income by selling foundation seed or basic seed abroad.

(ii) Domestic Potato Marketing

The domestic market for Bhutanese table potatoes offers additional future possibilities. However, since rural potato producers rarely buy potatoes to eat, an increase in domestic potato demand depends largely on the growth of urban areas. These areas offer some prospects for increased table potato consumption because they are the principal food deficit regions in the country. More generally, growth in domestic demand for Bhutanese potatoes could be fostered by instituting programs to promote greater table potato consumption and re-evaluating the present food import practices of the FCB.

Some common potato seed also will be marketed inside Bhutan in the years ahead. The expanding number of local Sunday fairs will enable more small-scale potato producers to come in contact with additional sources of seed besides local commercial growers or the village retail store. This development should help common seed sales. Common seed sales may be hurt, however, by the increased production and availability of improved seed. Relative seed prices and the price for table potatoes in India, also will affect future domestic marketing prospects for common seed.

Similar considerations will affect future domestic marketing prospects for high quality seed. Price per kilo, quality and productivity will influence Bhutanese potato producers' decision whether to purchase high quality seed or some other type of seed potato. Another important factor is the extent to which the national potato program devotes some resources to promoting, not just producing, improved seed.

1.2 Conclusions and Recommendations

This report concludes its assessment of the present patterns and future prospects for Bhutanese potatoes on a note of cautious optimism. Readers are cautioned that the report's description and analysis of Bhutanese potato marketing is basically qualitative. While the author's assessments are often supported by available statistics or field data, much of what is written here is descriptive and assumes that statements by Bhutanese producers and Indian traders are dependable. Nevertheless, some conclusions are reasonably certain: Potatoes are among the most important food crops in Bhutan. Most of what is produced is exported. Indian consumers prefer a small, oval white potato. In West Bengal, they pay more money for red-skinned varieties. Bhutan exports table potatoes, common seed, and high quality seed. Some table potatoes are re-graded and sold as common seed; other common seed is sold by Bhutanese producers as such. Still, most Bhutanese potatoes are exported for table consumption.

Other conclusions are less definitive. While relative prices for red-skinned potatoes are higher than for white-skinned varieties, relative profits for red-skinned vs. white-skinned are less clear. Use of Bhutanese seed for the early and/or late crop in northern West Bengal—hence the size of this seed market—also remains vague. The quantity of high quality seed that can be sold to Indian buyers in the future at a guaranteed price is really not known. Finally, how Bhutanese consumers would respond to a shift in relative prices for imported rice versus domestic potatoes is also uncertain. For example, higher rice

prices may lead consumers to eat the same amount of rice, because rice is the staple, but to purchase less trimmings such as potatoes because of less available money. Or, higher rice prices may increase the demand for potatoes—urban residents substituting cheaper potatoes for more expensive rice. Any of these issues could serve as the focus of future potato marketing research.

From the policy perspective, the present support price for table potatoes is questionable for several reasons.

First, few developing countries have a potato support price. They simply lack the financial resources.

Second, during the 1974 to 1981 period, the Bhutanese potato support price was roughly twice the market price received by growers in India (Rao et al 1982). Such a high support price may be justifiable in the short term to encourage some farmers to augment commercial production, but is less defensible as a long-term policy.

Third, the support price includes a "normal profit" in the calculation. Under such circumstances, Bhutanese potato growers receive, in effect, a supernormal profit in good years when they sell to private traders, and a normal profit in bad years, when they sell at the support price to the FCB. In other words, present support price policy means that Bhutanese potato growers receive all the benefits but assume none of the risks associated with potato marketing.

Fourth, no study of potato production costs serves as a basis for calculating the annual support price. Instead, rough estimates are used. Although such figures may have been the only ones available in 1974, when the decision was made to initiate the program, more systematic information gathering is now required as the program can cost the Royal Government of Bhutan millions of Ngultrums.

Fifth, instead of supporting the price for table potatoes and in so doing distributing revenues, the Bhutanese should institute policies for collecting revenues and thereby make the program more self-sufficient. Such policies could help raise farmers' incomes on a permanent basis by helping to finance multiplication and promotion of improved seed in the Kingdom.

The report's overall assessment is optimistic. Bhutanese farmers have had 3 years in succession of favorable prices for table potatoes, common seed, and high quality seed. As a result, they have marketed several thousand tons of potatoes during that time. Moreover, government institutions and personnel in Bhutan have a growing sense of responsibility concerning the work necessary to promote further market development. Thus, although the quantities envisioned marketable by this study may be less than originally anticipated, they are, after all, just educated guesses about apparent future trends. In the final analysis, efforts by the Bhutanese themselves to raise productivity, to lower unit costs, to increase quality, and to improve potato marketing will largely determine whether or not these estimates prove accurate.

As a general recommendation, then, the author encourages the Bhutanese to continue to pursue plans to diversify their potato marketing as part of an overall effort to develop the national potato program and the entire economy. It should be emphasized, however, that the Bhutanese sell potatoes in a highly competitive and

volatile market. Consequently, efforts to increase potato production should be complemented by acting on a series of specific marketing recommendations listed below. These recommendations refer to three general areas: (a) market promotion, research, and information; (b) market institutions, administration, and personnel, and, (c) marketing policy and food self-sufficiency.

A. Market Promotion, Information, and Research

In this area the report recommends:

1. Seeking out alternative sources of high quality seed for multiplication in Bhutan. Total dependence on Indian seed suppliers restricts program planning and development.

2. Selling Bhutanese high quality seed first to local growers to increase the quality of what they produce and export, and second to buyers in West Bengal and elsewhere. This priority will make it necessary for national program personnel to set aside some resources to promote use of high quality seed in Bhutan as well as to produce varieties that local growers want to purchase. Two possible ways for promoting grower interest in high quality seed are demonstration plots in different potato producing areas, in farmers' fields, and group visits by farmers to government farms.

3. Providing market information via correspondence, newspaper ads, or personal visits by FCB staff to more foreign buyers about the quantity, quality, and type of Bhutanese potatoes available for sale.

4. Relaying weekly market information to FCB highland depots about prices and flows for potatoes in the border towns. This information could be transmitted, for example, by radio broadcast.

5. Organizing small groups of farmers for field trips to Indian markets so they can see rival products, meet with commission agents, and inform growers in their districts on their return.

6. Utilizing contacts with various Indian commission agents and with Bhutanese trade representatives abroad to collect information about rival foreign products. This data should be used to prepare regular written reports about the competitive position of Bhutanese potatoes. The reports should improve Bhutan's bargaining position in annual negotiations for sale of high quality seed.

7. Collecting production and market cost data in Bhutan to help assess the relative profitability of table, common, and high quality seed, in general, and red-skinned vs. white-skinned varieties, in particular.

8. Studying the costs and returns to potato processing before further efforts are made to promote potato starch as a new export product.

9. Strengthening contacts with the Bangladesh national potato program to assess future prospects for foundation seed exports and their particular varietal needs.

B. Market Infrastructure, Administration, and Personnel

In this area, the report recommends:

1. Pursuing plans to organize regulated markets for potatoes and other products in Galeyphug and S./Jongkhar. Services provided sellers in these markets (weighing, calculations of accounts, overnight storage and immediate payment as apparently planned for 1983) should be charged for on a cost basis. Plans to organize additional weekly fairs around the Kingdom should also be pursued and publicized.

2. Reviewing licensing procedures for auction yard merchants so as to promote maximum participation by as many reputable buyers as possible. Every incentive should be given to encourage greater participation by Bhutanese traders in these markets. Border and bazaar taxes should be re-evaluated to consider their consistency with export promotion programs at the farm level.

3. Developing plans for efficient use of the new potato cold storage facilities in Phuntsholing. These plans should include estimates of rental fees for storage space, contingency arrangements in case electricity supplies are cut off, and the relative advantage of cool storage using rustic facilities in the highlands vs. cold storage using refrigerated facilities in the foothills. Such plans should distinguish between 1- or 2-month storage (and germination) of ware potatoes, which would be sold as common seed and more long-term storage of table potatoes, which would be sold for human consumption. Given production and price patterns for Indian table potatoes, the latter possibility does not seem economically viable. Re-sale of stored Bhutanese table potatoes to Bhutanese farmers as quality seed should be prevented.

4. Providing producers with simple, illustrated pamphlets about correct grading procedures and requirements of common seed vs. high quality seed vs. table potato export markets in terms of potato size, varieties, and time of sale. Extension agents (and auction yard personnel) should distribute these pamphlets prior to harvest and conduct grading clinics in their districts.

5. Discontinuing shipment of high quality seed and table potatoes in special bags. Since the DOA cannot prevent re-use of these bags after they leave Bhutan, an ordinary bag with an official invoice should be the standard shipping arrangement. This protects quality reputation of official potato exports.

6. Assigning someone, on a part time basis, from the regulated market staff to collect and to forward potato prices and quantities sold to the highland FCB depots.

7. Giving top priority to assignment of DOA's economist to the marketing cell. This person should be assisted in administration of the potato marketing program—table potatoes, common seed, and high quality seed—by Mr. Dorji of the FCB. Assignments should be on a long-term basis to promote continuity in the program. At the outset, every effort should be made by Mr. Awasthi to provide these two individuals with a minimum of 3 months in-service, informal training.

8. Institutionalizing regular cooperation and consultation between DOA, FCB and Ministry of Trade concerning potato exports.

9. Improving accounting procedures of high quality seed program to include an annual written report listing expenses incurred, revenue received, and resulting profits or losses.

C. Marketing Policy and Food Self-Sufficiency

In this area, the report recommends:

1. Promoting greater institutional use of potatoes in schools and government facilities.

2. Urging local contractors to purchase some Bhutanese potatoes for their workers, rather than entirely imported food.

3. Curtailing sale of imported rice from August to October as part of a food self-sufficiency, potato pro-

motion campaign. This policy may prove more palatable to the general public if it is accompanied by information about the potato's nutrition and alternative ways of potato preparation.

4. Abandoning support-price system for table potatoes over the next 3 years. To encourage increases in productivity and a reduction in the government's dependence on foreign financial support, the present support price system for table potatoes should be gradually eliminated. In the immediate future a revised support price that covers only "cash costs" associated with potato production should be announced. This support price should include neither the cost of family labor, land, and oxen nor a margin for normal profit. The revised support price should be dropped after 3 years.

5. Restricting payment of table potato support price to only those farmers who freely submit to a proper inspection of their potatoes at the appropriate FCB depot.

6. Making every attempt to negotiate price and quantity for high quality seed potato exports to India before the guaranteed price is declared to growers and planting begins on government farms in Bhutan. If negotiations cannot be conducted in such a fashion, a much more modest guaranteed price that covers only cash costs should be announced to registered Bhutanese seed growers.

7. Restricting participation in the high quality seed export program only to those registered farmers who: (a) buy their seed from the DOA; (b) comply with quality control measures to insure top standards are enforced on a regular and equal basis, and (c) sell agreed upon quantities of seed to the program as specified in the contract.

8. Calculating the selling price of improved seed to local growers on the basis of improved cost of production estimates.

9. Developing alternative internal sources of financial support for the potato program, for example selling improved seed at a slight profit.

CHAPTER TWO

Economic Development and Potatoes in Bhutan

Introduction

Time and again experience has shown that development, particularly agricultural development, rarely takes place in a vacuum. Hence, for agricultural development programs to be successful, a variety of prevailing factors must be considered prior to implementation: for example, ecological conditions, the socioeconomic organization of production, consumption patterns, access to markets, and agricultural price policy. The proposed national potato development program in Bhutan is no exception. In fact, given that most Bhutanese potatoes are exported to India, the task of understanding how potatoes fit into on-going production and marketing activities is doubly difficult. Under these circumstances, Bhutanese potatoes are really part of two production and marketing networks, *not* just one. Previous reports by Karmacharya (1981) and Poats (1982) have discussed potato production and consumption, respectively, in Bhutan. The purpose of this study is to explain how Bhutanese potatoes are marketed abroad and at home in an effort to promote Bhutanese economic development.

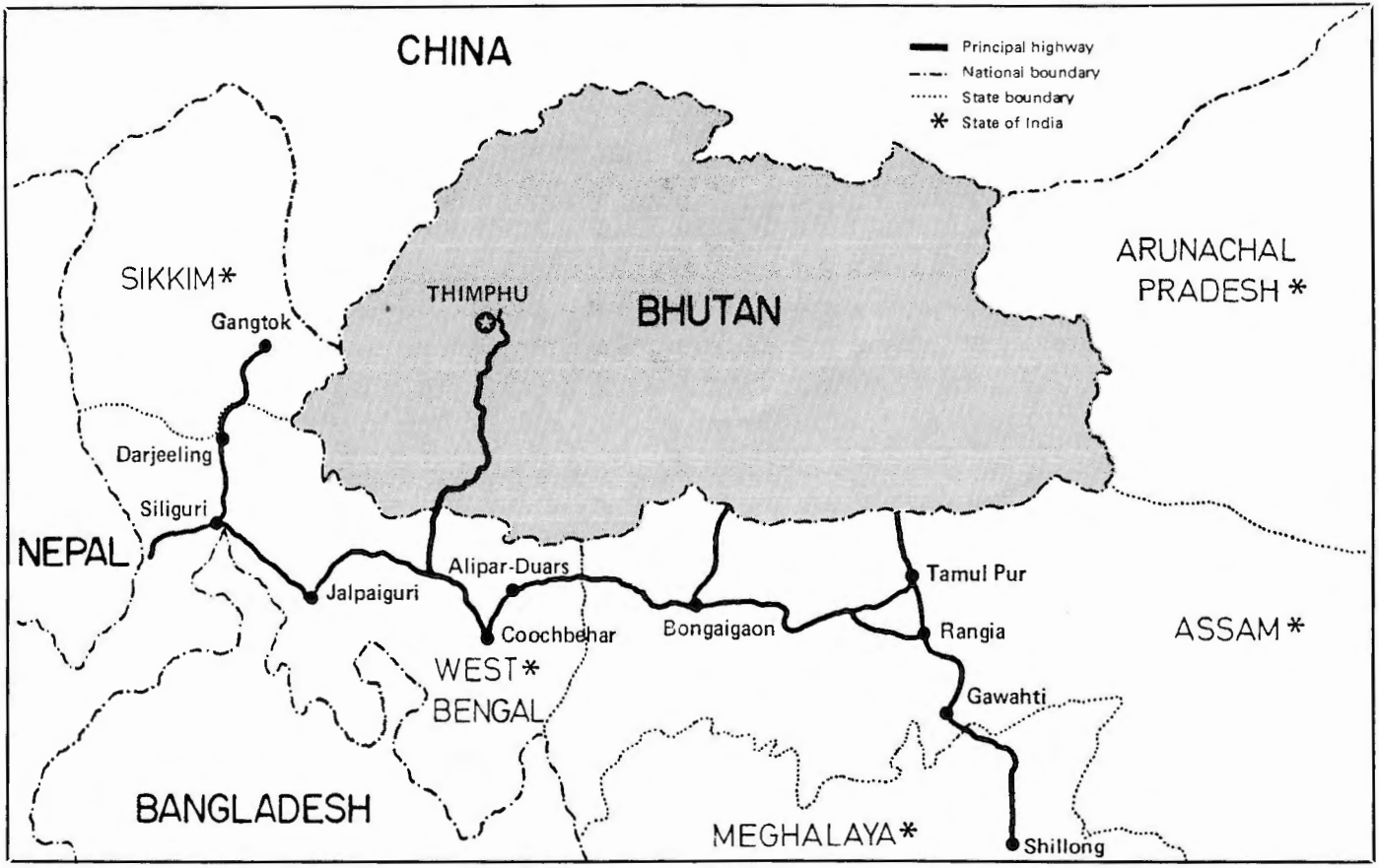
2.1 Economic Development in Bhutan: An Overview

(i) The New Policy of Modernization

The Kingdom of Bhutan consists of roughly 47,000 square kilometers of mountainous terrain nestled between China (Tibet) in the north and India in the south (West Bengal and Assam), east (Arunachal Pradesh), and west (Sikkim). For centuries, peoples of what now is Bhutan were content to preserve their traditional way of life by living in semi-isolation behind natural barriers. In response to rapidly changing regional political developments of the post World War II era, however, the late King Jigme Dorji Wangchuk reversed this long standing practice. In the 1960's the former monarch set in motion a series of reforms intended to promote greater interaction with the world community of nations, to increase his subjects' socioeconomic well-being and at the same time, to preserve the Kingdom's most admirable customs. During the last decade, the late King's son has continued to pursue his father's goals. As a result, all development programs—from apples to water resources—are considered in terms of the Kingdom's new policy of modernization.

(ii) Economic Dependence on India

Another factor involved in the evaluation of proposed development programs in Bhutan is the Kingdom's economic dependence on India. The open border with India and Bhutan's limited trade with third countries mean that India is Bhutan's dominant trading partner. In fact, although



Map 1. Bhutan and adjoining countries.

Bhutan has its own currency—the *Ngultrum*—the Indian *rupee* is also used as legal tender in the country.[1] Estimated trade figures for 1978, the latest information available, indicate a negative balance with India of roughly *Nu.* 80 million (see Table 2.1). In particular, Bhutan depends on India for several necessities, mainly petrol and rice. Furthermore, given the trained manpower shortage, Indian technicians occupy numerous positions in Bhutan's civil service, especially at higher, decision-making levels. India also continues to provide most capital necessary to finance Bhutan's ambitious development plans. Consequently, Bhutanese policy makers and administrators are eager to place the country's economic relations with India on a more equal footing. They also seek to expand trade with third countries to something beyond underutilized, formal agreements.

(iii) Agriculture in the Bhutanese Economy

An additional consideration in reviewing proposed development programs in Bhutan is the extent to which such programs build upon existing economic activities. Estimated Gross National Product (GNP) in 1979-80, the only data available, gives one indication of the importance of agriculture in Bhutan's economy (see Table 2.2). Crop production, animal husbandry and forestry generated more than 50% of estimated GNP. Thus, with the exception of a handful of small factories along the border and the hydroelectric project at Chukha, Bhutan has an agrarian economy. An estimated 95% of the work force is employed in agriculture.

The agricultural economy consists primarily of subsistence production on family farms. While most crops and livestock go to feed the peasant household, modest surpluses frequently are exchanged for essential items not grown on the farm such as salt. Trade is through traditional rural marketing networks based on the barter system.

Thus, although Bhutan is one of world's least developed countries

[1]Exchange rate for the Bhutanese *Ngultrum*, Nu. 9.5 = US $1 (October, 1982).

Table 2.1 Bhutan: Value of exports and imports, 1978. (Million Nu.).

Major Groups	Exports	Imports	Trade Balance
Food	15.55	16.44	− 0.89
Rice	0.50	3.07	− 2.57
Beverage & Tobacco	22.28	4.17	+18.11
Minerals, Petroleum Products	9.39	16.27	− 6.88
Manufactured goods	0.54	14.86	−14.32
Vegetable Oils and Fats	0.16	1.70	− 1.54
Construction materials	0.35	54.93	−54.58
Timber products	9.57	0.79	+ 8.78
Clothing and foot wear	0.06	0.65	− 0.59
Fruits and spices	2.76	0.39	+ 2.37
Animals and Birds	0.06	0.02	+ 0.04
Miscellaneous	1.87	32.02	−30.15
Total	62.60	143.27	−80.67

Source: Karmacharya, 1981

with an estimated GNP per capita of about US$100, the existing agrarian economy provides an adequate standard of living for almost all the 1 million plus Bhutanese. The countryside exhibits little sign of malnutrition or extreme deprivation. Likewise, the Kingdom's towns and administrative centers show relatively few indications of growing urban poverty fre-

Table 2.2 Bhutan: Estimated Gross National Product (GNP) at market prices 1979-1980. (Million Nu.).

Sector	Contribution to GNP	%
1. Agriculture	491.5	54.3
a. Crop Production	255.7	28.2
b. Animal Husbandry	76.5	8.4
c. Forestry	159.3	17.6
2. Manufacturing and Mining	91.7	10.1
a. Manufacturing	54.0	6.0
b. Small and Cottage Industries	18.1	2.0
c. Mining	8.6	0.9
d. Tourism	11.0	1.2
3. Services	133.8	14.8
a. Power	2.7	0.3
b. Communications	5.8	0.6
c. Transport	27.6	3.0
d. Construction	18.9	2.1
e. Social Service e.g. health, education, etc.	34.8	3.8
f. Financial Institutions	15.4	1.8
g. Trade	28.6	3.2
4. Government and Administration	106.6	11.8
5. Net rental income	82.0	9.1
Total	905.6	100%

Source: United Nations, 1981.

Table 2.3 Bhutan: Government development expenditures (1961-1986).

	1st Plan (1961-65)	2nd. Plan (1965-71)	3rd. Plan (1971-76)	4th Plan (1976-81)	5th Plan* (1981-86)
Total Outlay (Million Nu.)	107.2	202.2	459.5	797.2	2646.1
Agricultural Sector (%)[1]	3.2	13.6	20.0	29.8	18.0
Hydro-electric power (%)	1.4	4.6	6.6	5.1	7.5
Industry (%)[2]	4.1	3.9	11.7	14.0	19.0
Social Services (%)[3]	11.8	25.9	27.9	22.4	15.9
Public works (%)[4]	58.7	34.9	18.4	14.8	18.9
Transport and Communication (%).	7.5	8.8	7.8	6.8	12.3

Source: IFAD, 1981; U.N., 1981.

[1]Plant production, irrigation, and animal husbandry.
[2]Including forest.
[3]Education and health.
[4]Mainly roads.
*Proposed

quently present in other Third World countries.

Nevertheless, Bhutan's agricultural economy is in transition. The late King's agrarian reform law gave virtual universal access to land. Over the last several decades, more and more growing areas gradually have emerged as centers of commercial export crop production, e.g. Chapcha, Paro, Bumthang. Bhutanese officials are concerned, however, about recent dependence on food imports, particularly rice (FAO 1982). The shortage of cultivable land and low levels of productivity on Bhutanese farms have combined with a steady, albeit moderate (1.2%), rate of population growth to generate a small, but distributing food deficit (5,000 to 15,000 tons per year).

(iv) Agricultural Development: Goals and Strategies

Development programs in Bhutan also are reviewed in terms of the Kingdom's development goals and strategies. Since the preparation of the first Five-Year-Plan in 1961, the basic goals of Bhutanese economic policy have remained the same:

a) to improve living standards of the people, especially those belonging to the poorer sections; and
b) to achieve economic self-reliance.

In the course of the last 20 years, however, program emphasis in support of these basic goals gradually has shifted from an early concentration on public works, mainly roads, in favor of greater expenditures on industry (including forestry) and agriculture (see Table 2.3).

The current, fifth Five-Year-Plan (1981-1986) sets the following objectives for Bhutanese agricultural development:

a) to achieve self-sufficiency in food grain production within 5 years;
b) to raise incomes in the farming community, and
c) to improve nutritional intake of the population as a whole both as a result of increasing incomes as well as of diversified farm production.

The strategy adopted to achieve these goals emphasizes improved productivity and generation of marketable surpluses. On the one hand, greater utilization of improved agronomic practices and of high yielding inputs are considered key determinants of improved productivity. On the other, cultivation of cash crops, (potato and cardamom[2], for example) and improved marketing services are seen as critical elements, in addition to the improved productivity necessary to generate the planned growth in marketable surpluses.

Through its policies, programs, and institutions, the government is to play a major role in implementation of agricultural development strategy. For example support price policies for principal staple and cash crops provide financial guarantees for farmers to increase production. Plant protection services are subsidized by the government. In addition, the Department of Agriculture (DOA) manages seed multiplication programs on government farms and seed distribution to local farmers and foreign buyers.

(v) Constraints to Agricultural Development

Several constraints condition pursuit of development goals and strategies in Bhutan. The principal con-

[2]Cardamom is an Asian plant of the ginger family used in medicine and as a spice. *Webster's New World Dictionary* 2nd edition (1970).

straints to agricultural development are:

1. Lack of financial resources. Roughly 80% of government budget for the fifth Five-Year-Plan is to be financed with loans or grants from abroad.

2. Shortage of trained manpower. There were fewer than 10 Bhutanese agricultural graduates in the country in 1981.

3. Inadequate infrastructure. Mainly because of rugged terrain, many of the country's remote rural communities remain in semi-isolation due to limited road and communications network.

4. Insufficient supply of farm labor. Indigeneous farm labor shortage, lack of capital and credit to mechanize, and government restrictions on hiring foreign farm workers thwart more labor intensive agriculture.

5. Shortage of cultivable land. While government policies restrict expansion of the agricultural frontier, shortage of cultivable land means most farms are less than 6 hectares in size.

6. Complete dependence on fertilizer imports. A fertilizer shortage in India has meant unreliable fertilizer exports to Bhutan.

7. Limited availability of improved seed. Due to the Kingdom's geographic isolation and mountainous terrain, production and distribution of improved seed is a limited and recent phenomenon.

8. Lack of knowledge about prevailing production, consumption, and marketing practices. Farmer surveys or descriptions of potato production and/or marketing are virtually nonexistent.

2.2 Bhutanese Agricultural Development and Potatoes

Within the agricultural sector, separate development programs are under consideration for each major activity. The nature of these programs tends to vary depending on: (a) the activity's relative importance and, (b) if resulting production is destined for export or domestic use. Interest in potatoes has been primarily in terms of export crop potential. But, this emphasis has obscured the potato's relative importance in other respects, such as total production, existing per capita consumption, and potential for increases in domestic utilization.

Potatoes ranked fourth in total production among major crops in Bhutan, according to the latest statistics for the 1981/82 crop year (see Table 2.4). The relative importance of potato production is attributable to its relatively high estimated average yields in comparison with the estimated average yields for cereals, pulses and oil crops. More importantly, by the end of the present Five-Year-Plan, potatoes are expected to grow in relative importance. Area planted in potatoes is projected to increase by about one third and total potato production to nearly double. In fact, projected increases in output and area planted are higher for potatoes than for any of the cereals or pulses.

Potatoes also were first in total volume and second in total value of the four principal export crops handled by the Food Corporation of Bhutan (FCB), during the period 1975/76 to 1978/79, (see Table 2.5). Nevertheless, the FCB either lost money or barely broke even on potato sales in each of these years. Moreover, in 1979, FCB potato export operations sustained a loss of *Nu.* 22 million. Although in recent years nearly

Table 2.4 Bhutan: Present and planned agricultural production.

	Present (1981/82)			Planned (1986/87)		
	Area (acres)	Average yield (tons/acre)	Production (tons)	Area (acres)	Average yield (tons/acre)	Production (tons)
Paddy	69,115	0.83	57,350	91,505	0.92	84,475
Maize	140,290	0.57	80,730	129,450	0.65	85,095
Wheat/Barley	30,390	0.44	13,290	41,050	0.55	22,530
Buckwheat/Millets	38,440	0.32	12,310	37,050	0.34	12,650
Pulse Crops	9,970	0.25	2,420	13,050	0.29	3,825
Mustard	7,175	0.26	1,890	13,515	0.28	3,855
Potato	9,095	2.75	24,925	12,475	4.0	50,010
Ginger	1,050	1.9	2,000	1,950	2.0	3,900
Chili and Other Vegetables	6,640	1.5	10,170	6,900	1.6	11,150
Orange	15,430 (53% bearing)	3.1	25,560	19,825 (77% bearing)	3.5	53,070
Apple	3,715 (45% bearing)	2.0	3,345	4,570 (83% bearing)	2.35	8,770
Cardamom	14,540 (74% bearing)	0.25	2,770	16,410 (87% bearing)	0.28	4,105

Source: Planning Cell, DOA.

Table 2.5 Bhutan: Estimated exports of cash crops by FCB, selected years. (Quantity: Tons; Value: Thousand *Nu.*).

	1975-1976		1976-1977		1977-1978		1978-1979	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Apples	7	14	23	46	70	175	70	174
Cardamom	79	600	99	1944	337	5096	200	3900
Oranges	300	275	570	283	N.A.	N.A.	193	219
Potatoes	1046	1046	2476	1823	1146	1622	1397	1507

Source: Rao, et al., 1982.

Potato vender leaving Bumthang with load of potatoes.

all potato exports went through private traders, government officials still are concerned about another possible collapse in prices. This concern is further magnified because the latest Five-Year-Plan calls for substantial increases in potato exports by 1986/87.

Potatoes also play an important, if often underestimated, role in the Bhutanese diet. While the major staple in Bhutan is rice, potatoes and a variety of other vegetable, dairy, and meat products serve as complements. Still, even estimates of annual per capita consumption of individual food items in Bhutan are unavailable. Estimates of annual per capita cereal consumption vary from 199 kilograms, based on the pilot Consumer Expenditure Survey in 1977, to about 140 kilograms, based on FAO Food Security Mission. In comparison, estimates of per capita potato consumption recently have been revised upwards from 5.2 kilograms per year. In summary, then, there are several reasons to consider increasing Bhutan's potato production.

2.3 Issues for This Study

In the context of prevailing factors described above, Bhutans' national potato development program proposes to increase production, especially high quality seed, over the next 5 years. While such increases in production are considered quite feasible technically, a key series of marketing issues must be studied. The focus of this study, then, can be organized around the following set of critical questions:

1. If Bhutan produces more potatoes, then can these potatoes be sold?

2. What kind of potatoes can be sold?

Type: Seed (common or high quality)? Table potatoes?
Variety: Swiss red? Kufri-Joyti? Other varieties?

Appearance: Oval or round? Small or large? White or red-skinned?

3. Where can these potatoes be sold?
Domestic sales: Fairs? Retail shops? Auction yards?
Indian sales: West Bengal? Assam? Other Indian states?
Third Country sales: Bangladesh? Nepal? Sri Lanka, or Burma?

4. When can these potatoes be sold?
Monthly: July-August? September-October? November and beyond?

5. To whom can these potatoes be sold?
Type of buyers: Farmers? Traders? Foreign potato programs?

6. How many potatoes can be sold?
Unit of sale: 30 kilogram packets? 80 kilogram bags?
Total quantities: 5,000 tons? 10,000 tons?

7. How can these potatoes be sold?
Types of payment: Cash? Check? Bank draft?
Terms of sale: Contract (formal or informal)? Auction?

8. Form in which these potatoes can be sold?
Fresh market: graded by variety and size? Ungraded?
Processed potatoes: starch?

9. What kind of infrastructure is needed for these potato sales? Storage facilities? Their capacity? Private vs. Public?
Processing Plants? Their capacity?
Auction yards? Their number? Location?

Harvesting potatoes near Khadapchu.

10. What kind of transportation and communication facilities are needed to sell these potatoes?

11. At what price can these potatoes be sold? Open market price? Support price? Dual price mechanism?

12. Who will sell these potatoes? DOA? FCB? Private traders? Growers?

13. Principal factors that affect future marketing prospects? Production factors: Quality? Productivity in India vs. Bhutan? Marketing factors: Unit costs? Promotion?

2.4 Methodology Utilized for this Study

Little has been written about Bhutanese agriculture in general and potato marketing in particular. The recent study (Rao et al. 1982) is perhaps the only publication on potato marketing available. Consequently, the author gathered information in the field to address the questions outlined above.

The results presented in the following pages are based on: (a) a synthesis of the limited, available literature; (b) informal interviews with numerous producers, traders, and government officials—a complete list of contacts is in the appendix; and (c) participant observation of potato marketing in Bhutan, India and Bangladesh.

Given the shortage of reasonably reliable time-series data, this report tests no formal quantitive models. Instead, it provides a descriptive analysis of prevailing potato marketing patterns and a largely qualitative assessment of Bhutan's future potato marketing prospects. Subsequent, more detailed research, for example, of costs of potato processing can build on this baseline study.

CHAPTER THREE

Potato Production and Consumption in Bhutan

Introduction

Official interest in the systematic improvement of potato production and consumption is a relatively recent phenomenon in Bhutan. According to Roddar (1982), the Department of Agriculture (DOA) only started to promote potato production about 10 years ago. Partly for that reason, perhaps, accumulated knowledge about existing potato production and consumption patterns is rather meager. Nevertheless, as is made clear below, understanding the basics of Bhutanese potato production and consumption is critical for appraising future potato marketing prospects. With that thought in mind, this chapter provides a concise description of present potato production and consumption activities. In so doing, it relies heavily on recent research by Karmacharya (1981, 1982a, 1982b), Poats (1982) and Roddar (1982):

3.1 Potato Production

Potatoes have been cultivated in the region of present day Bhutan for at least 2 centuries. Some accounts trace their introduction to the travels of George Bogel in 1774/75 on behalf of the East India Trading Company (Roddar 1982). Others contend that the potato may have been introduced as early as the late 1600's (Poats 1982). In any event, the modern era of Bhutanese potato production dates back roughly 30 to 40 years. According to the oral tradition, Bhutanese growers around Chapcha first started regularly planting and exporting potatoes to India at about that time.

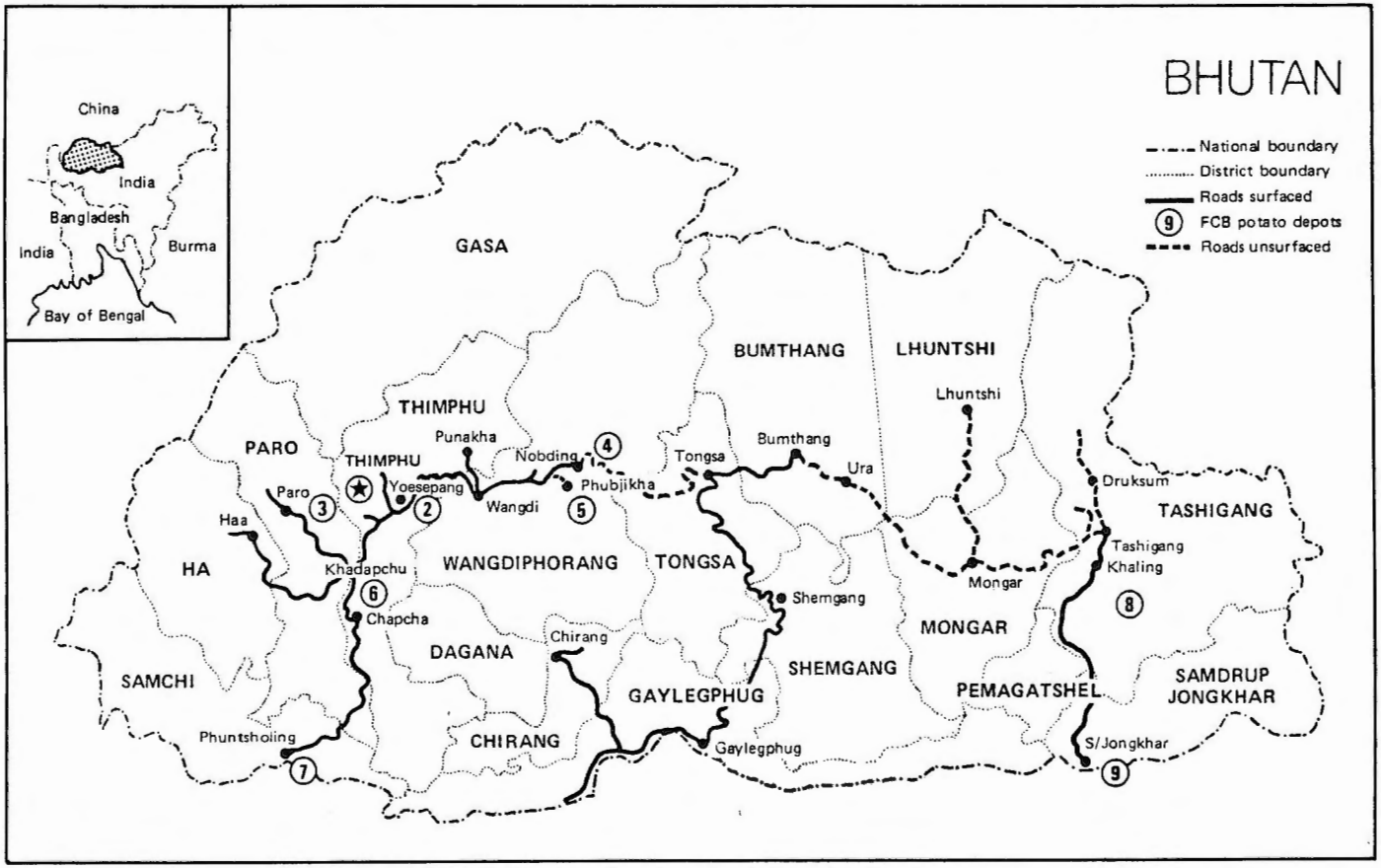
(i) Agroecological Regions

While Bhutan is a mountainous country throughout, considerable differences in topography and climate exist within the national boundaries. The nature and importance of potato production varies depending on which of three generally recognized agroecological regions are being discussed (FAO 1982). These regions are:

a) The Western Hills Region

Typography of this region is noted for several relatively flat, irrigated river valleys that vary in altitude from 1,000 to 2,500 meters. The rainy season is generally during summer months of June to August. Still, in comparison to other parts of Bhutan, the climate in the Western Hills region is sunny and quite dry. Estimated annual rainfall varies between 500 and 700 millimeters.

The Western Hills region consists of the districts of Paro, Thimphu/ Punakha, Wangdi, Dagana, Ha, and Gasa. The irrigated river valleys in these districts are devoted principally to paddy production. Potatoes frequently are planted before paddy as an early cash crop with harvest in May or June, e.g. Paro. Proceeds from potato sales then help finance paddy production. Nevertheless, the main potato crop in this region is



Map 2. Bhutan showing districts and major towns.

grown on dry land slopes overlooking the valley floor. In this case, potatoes are rotated with wheat, buckwheat and barley.

b) The Eastern Hills Region

This region is the most rugged and mountainous in all of the Kingdom. Apart from the relatively small area around Bumthang, there is no flat farm land in this part of the country. Instead, the Eastern Hills are characterized by a seemingly unending series of spectacular gorges and lofty slopes separated from the Western Hills by the Black Mountains range. Given the extremely rugged terrain, the Eastern Hills remain the most under-developed region in Bhutan. Consequently, official climatological data are difficult to obtain. The Eastern Hills region is noted for its frequent morning mists in winter. Annual rainfall reportedly varies between 700 and 1,000 millimeters.

The Eastern Hills region includes the districts of Tongsa, Shemgang, Bumthang, Mongor, Pemagatsel, Tashigang and Lhuntsi. These districts, in particular Mongor and Tashigang, are noted for dry land maize production. With the exception of Bumthang and Pemagatsel, paddy grown on irrigated terraces is the second most important crop in terms of area planted. At higher altitudes, a rotation that includes wheat, buckwheat, barley and potatoes replaces maize and/or paddy. At lower altitudes in Shemgang district, potatoes are intercropped with maize. In the Eastern Hills region, few potatoes are planted on irrigated land.

c) The Southern Foothills Region

This region has three distinguishing ecological characteristics: First, although parts are extremely steep, the area generally has a much lower elevation than the rest of the country. Second, this region includes a sliver of flat farm land that separates the plains of India from the foothills of Bhutan, along the Southern border. Third, the climate in this region is hot and humid. Estimated annual rainfall for the Southern Foothills is 5,000 millimeters.

The Southern Foothills region consists of the districts of Samchi, Chirang, Galeyphug, and Samdrup Jongkhar. Principal crops in order of importance are: dry land maize, irrigated paddy, and dry land buckwheat or millet. Relatively, few potatoes are grown in the Southern Foothills. Instead, oranges and cardamom are cultivated as the main cash crops.

(ii) Potato Production, Area, and Yields

According to a recent DOA survey, some potatoes are grown in every district in Bhutan. Still, national potato production is geographically concentrated. Four districts: Paro and Thimphy in the Western Hills region along with Bumthang and Tashigang in the Eastern Hills region planted and produced nearly 70% of the national total in 1981 (see Table 3.1).

Yields also vary considerably. The Western Hills region with its irrigated river valleys and productivity conscious commercial growers has the highest estimated average yields: 3.16 tons per acre. With the exception of Bumthang district, estimated average yields are lowest in the more isolated parts of the Eastern Hills region: 1.57 tons per acre in Mongar, for example. Farmers in these areas have limited access to irrigation, extension and high yielding inputs such as fertilizer, improved seed.

In addition to ware potato production, seed potatoes are grown at several sites around Bhutan. In the West-

Table 3.1 Bhutan: Estimated area planted, production, yields, marketable surplus for potatoes by agroecological region, 1981-82 crop year.

Region	Area planted (acres)	Total production (tons)	Yields (tons/acre)	Marketable surplus (tons)
Western Hills				
Paro	1,375	4,250	3.09	3,275
Thimphu/Punakha.	1,665	5,475	3.29	4,015
Wangdi.....	400	1,350	3.38	925
Dagana.....	20	50	2.5	....
Ha.....	375	1,075	2.87	875
Gasa	5	8	1.6	....
Sub-Total	3,840	12,208	3.18	9,090
% of Total	42.2	48.9	...	56.5
Eastern Hills				
Tongsa	60	170	2.83	100
Shemgang.....	270	700	2.59	350
Bumthang.....	565	2,475	4.38	1,325
Mongor.....	525	825	1.57	250
Pemagatsel.....	175	365	2.09	260
Tashigang.....	2,375	4,975	2.09	3,300
Lhuntsi.....	320	500	1.56	N.A.
Sub-Total	4,290	10,010	2.33	5,585
% of Total	47.1	40.2	...	34.7
Southern Foothills				
Samchi	225	400	1.78	.....
Chirang.....	325	1,000	3.08	700
Galeyphug	400	1,275	3.19	700
Samdrup Jongkhar .	15	30	2.0	.....
Sub-Total	965	2,705	2.8	1,400
% of Total	10.6	10.9	...	8.7
Total (All Regions)	9,095	24,923	2.74	16,075

N.A. = Not Available
Source: Planning Cell, DOA.

ern Hills region government farms at Yoesepang, Phubjikha and Pelela produce seed potatoes. During the 1982 season, the Yoesepang facility harvested roughly 20 metric tons of seed. Similarly, the Phubjikha farm produced roughly 75 tons of mostly high quality seed for export in 1982. Government farms at Pelela and Nasphgel also grow some potato seed (Roddar 1982) primarily for distribution to local growers.

(iii) Types of Potato Producers

Four major types of producers grow potatoes in Bhutan. The most market-oriented are the well-established, commercial potato growers around Chapcha, Paro and Thimpu in the Western Hills region and around Bhumthang and Khaling in the Eastern Hills part of the country. These farmers have the largest marketable surpluses per unit of production. They also use the most disciplined, if not sophisticated, agronomic techniques.

In contrast, perhaps, the most numerous group of Bhutanese potato

producers are kitchen gardeners. These growers plant small patches of potatoes adjacent to their homes in towns and administrative centers around the country. Included in this category are construction workers employed on sites throughout the country. In addition, many schools, monasteries and other such institutions plant potatoes in gardens to help supply the communal kitchen with fresh vegetables.

The third category of potato producers includes the government farms and experiment stations referred to briefly above. Some half-dozen such facilities exist throughout the Kingdom. They grow potatoes as a service to the nation's farmers and as a source of revenue to finance the future expansion of similar activities.

The final category of potato producers in Bhutan are the numerous semi-subsistence growers. They grow more potatoes than the kitchen garden producers, but have smaller marketable surpluses than the well-established, commercial farmers. They tend to be marginalized in the regions of major potato production. In other words, they have smaller, less fertile fields, or they grow potatoes in geographically isolated parts of the Kingdom—Ura, for example.

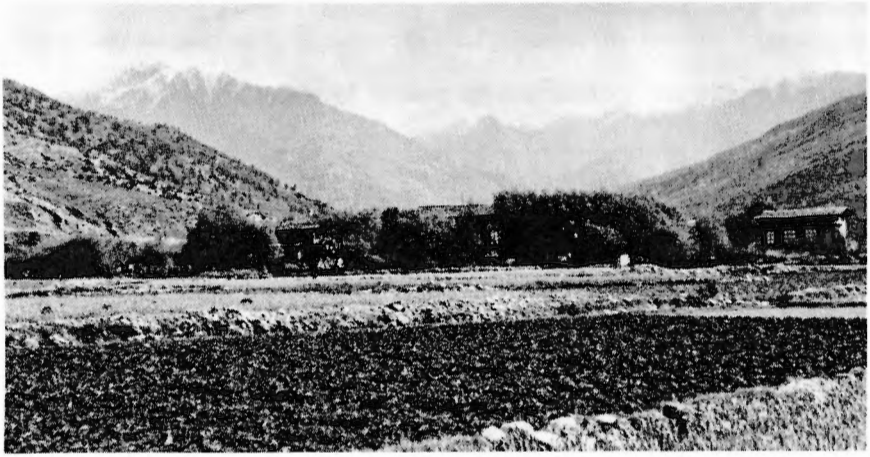
(iv) Varieties Planted and Growing Season

Bhutanese potato producers plant numerous potato varieties, both traditional and hybrid. The open border with India and customary trade between the Bhutanese highlands and neighboring potato growing areas in West Bengal, Assam, and Sikkim, has led to the introduction of several traditional Indian varieties such as Darjeeling Red Rounds. Other old potato varieties still planted in Bhutan are Magnum Bonum and *Dop Langay* (see Poats 1982).

During the last decade, the Swiss introduced the Dutch variety Desiree, known locally as "Swiss Red." The DOA's most recent seed multiplication program has promoted use of the Indian hybrid, Kufri-Joyti. The old German variety, Cosima, has also been grown lately in Bhutan. Furthermore, the Dutch hybrid, Maritta, is being planted as well.

The importance of one hybrid vs. another in terms of its percent of national potato production, has not

Farmer's irrigated fields in Paro Valley. (Photo by Poats).



Planned site for major seed farm in Phubjikha Valley to be operated by National Potato Program.

been throughly studied. Some casual estimates by DOA personnel suggest that Kufri-Joyti represents 50% or more of total production. Figures cited in Roddar (1982) imply otherwise (see Table 3.2). According to these calculations, other hybrids, like Maritta and Cosima (33.5%), and local varieties (32%) constitute a much larger percent of national output than previously believed.

The potato production calendar in Bhutan varies from region to region. Planting begins as early as December in Chirang district or around S./Jongkhar in the Southern Foothills region. It then continues during January and February around Paro and Chapcha in the Western Hills region. Planting concludes by early March in the Eastern Hills region, when Bumthang and Tashigang growers seed their potato fields.

A somewhat analogous pattern characterizes potato harvesting in the Kingdom. The earliest harvest is in May at the lower, foothill elevations. Some potatoes are even harvested in the Paro Valley at this same time. Nevertheless, the bulk of production

Table 3.2 Bhutan: Potato varieties planted by major growing center, 1982, (percent).

Growing Center/Variety	Maritta/Cosima	Swiss Red (Desiree)	Kufri-Joyti	Local
Bumthang	80	20	..	..
Paro	50	35	..	15
Tashigang	40	10	10	40
Thimphu	..	10	60	30
Other	20	30	10	40
Nationwide (based on acreage)	33	18	17	32

Source: Roddar, 1982.

is dug during August and September. Potato harvesting culminates in October and early November as farms at higher altitudes in eastern Bhutan complete digging activities.

(v) Farm-Level Production Constraints

A number of production constraints thwart potential increases in potato productivity at the farm level in Bhutan. The principal constraint is a shortage of clean seed. According to Karmacharya (1981), less than 10% of the total potato area used improved DOA seed during the 1979/80 and 1980/81 crop years. Since much of the locally available seed is from the same, degenerated germplasm used year after year, new seed must be imported from abroad to help raise yields.

A second related farm-level production constraint is incidence of potato diseases, (Karmacharya 1982 b). Continued use of degenerated, disease-susceptible seed is partly responsible for this constraint. Potato diseases of special concern in Bhutan are late blight, early blight, and wart.

Another potato production constraint is shortage of trained extension personnel. Similar to mountainous regions anywhere in the developing world, growing conditions vary dramatically within short distances in the Bhutanese highlands. Therefore, blanket recommendations for improved potato cultivation are simply inadequate. At the same time, however, the DOA has limited personnel and transportation to reach the numerous, semi-isolated potato producing communities.

Most hybrid potato varieties respond favorably to applications of chemical fertilizer. Yet, potato production in Bhutan has been handicapped by its dependence on fertilizer shipments from India, a country suffering through its own nitrogen shortage.

Another major constraint to potato production in Bhutan is the shortage of production credit. Potatoes are a

Dry land potato production near Chapcha. (Photo by Poats).

relatively expensive crop to produce. Studies frequently show that production costs per hectare for potatoes are at least three or four times production costs for most cereals. Hence, financing is a critical component in a potato productivity improvement program. Such credit is hard to secure in Bhutan.

Potatoes also are a fairly labor intensive crop. But, Bhutanese agriculture in general is characterized by a shortage of farm labor. This situation is made more difficult by government regulations restricting increased employment of foreign workers. Continued labor shortages reduce potato growers options when it comes to adopting more labor intensive cultural practices.

Finally, productivity increases on Bhutanese potato farms are hampered by limited knowledge of prevailing agronomic techniques. Farm level research about potato production is still in its embryonic stage. Experience in other countries clearly has shown the advantage of including potato farmers in the research process as early as possible (see Booth and Rhoades 1982).

3.2 Potato Consumption

Until 1982, Bhutanese potatoes were considered almost exclusively as a cash crop for export. Field work by Poats (1982), however, was largely responsible for the on-going reevaluation of the potato's actual and potential role as a food crop for domestic consumption. At a minimum, there is a growing consensus in Bhutan that, as Poats observes, "very little is really known about actual levels or patterns of potato consumption in the country."

(i) The Potato in the Bhutanese Diet

Although consumption patterns vary from region to region in Bhutan, rice is the basic, preferred staple everywhere. Potatoes then are considered a complementary vegetable by most of the Kingdom's inhabitants. As such, potatoes most frequently are boiled and served either with hot chillies or other sauces as a complement to the customary plate of rice. Or, they may be eaten as one ingredient in the seemingly infinite number of curries that add variety to the daily meal. Potatoes occasionally are consumed in local meat dishes.

Potatoes generally are consumed in their fresh form in Bhutan. Some potato chips are eaten in the larger towns. But, these are simply thinly sliced fried potatoes packaged in small bags for sale primarily to foreigners and the younger generation of Bhutanese. Few potatoes are used to make alcohol, flour, or industrial starch. Plans to use simple village level processing plants to produce bakery starch for export to India are still undergoing refinement through experimentation.

(ii) Levels of Potato Consumption by Region

In the absence of a detailed household consumer budget survey, comprehensive estimates of potato consumption by region are non-existent. Available information is based on a series of structured interviews carried out during 1982 in different regions and different locations (rural vs. marketplace) around the country (see Table 3.3).

Average annual per capita potato consumption was found to be similar among urban consumers ($\bar{x} = 39.6$ kilograms) and rural households ($\bar{x} =$ 45 kilograms). Nevertheless, within each group, considerable differences did exist. Consumers in the Western Hills generally reported eating more

Table 3.3 Bhutan: Estimated potato consumption by location and region, 1982.

Region	# of Interviews	Average Per Capita Potato Consumption Per Year (kg.)	Range in Consumption Per Year (kg.)
	Rural Households		
Western Hills	26	36	0.6—122.0
Eastern Hills	10	22	9.0— 78.0
Southern Foothills	14	63	13 —194
Total	50	45	
	Market Place Consumers		
Western Hills (Thimphu)	80	46	
Southern Foothills (Galeyphug)	80	41	
Southern Foothills (Sarbhang)	34	21	
Southern Foothills (Lamidara)	20	36	
Total	214	39.6	

Source: Poats, 1982.

potatoes. This result coincides with the known importance of potato production in this agroecological region. Most important, all groups reported a level of annual per capita consumption vastly superior to the previously reported national average of 5 kilograms per year. Moreover, the range in reported average annual per capita potato consumption among rural households was extremely high. This finding suggests that increases in the average level of per capita potato consumption would be compatible with the already prevailing consumption patterns of some consumers.

(iii) Types of Consumers

Potato consumers in Bhutan may be classified first as growers or non-growers. The most important potato consumers in Bhutan are potato growers. This group of consumers includes commercial producers, semi-subsistence farmers, kitchen gardeners, and a few institutions such as schools and monasteries. For these consumers, potato consumption is highly seasonal. They eat primarily potatoes that they grow themselves. Except for the kitchen gardeners, perhaps, growers rarely buy potatoes to eat.

Non-growers also consume potatoes in Bhutan. Individual non-growers such as resident expatriates, tourists, and shopkeepers tend to consume potatoes year round. Similarly, institutional non-growers such as Indian army posts, hotels, and restaurants also buy potatoes on a continuous basis. This type of potato consumer is much less numerous in Bhutan. However, they generally have higher incomes and therefore, their effective demand is much greater than that of other consumers.

(iv) Consumer Preferences

Consumers in Bhutan often express preferences for a particular variety, color, size, and shape of potato. Poats (1982) reports that rural households generally "liked the taste of the old or traditional varieties best." Like potato farmers in other parts of the developing world, they apparently grow some "old" or "traditional" varieties for their own consumption, but they plant mostly high

yielding "modern" hybrids for sale. Furthermore, if given a choice between red- and white-skinned hybrid varieties, most Bhutanese potato consumers prefer red-skinned ones. Again, the deciding factor seems to be "better taste."

Bhutanese generally do not like to buy big, round potatoes. The reason for this, perhaps, is that local potato dishes call for a small, oval-shaped potato. Smaller potatoes also are considered easier to prepare. In addition, small potatoes are less likely to have hollow hearts, as sometimes occurs with certain hybrid varieties when they are allowed to over-mature in the field. Finally, Bhutanese consumers, as do consumers everywhere, prefer to eat fresh potatoes in lieu of stored.

(v) Constraints to Increased Potato Consumption

Among the major constraints to increased potato consumption in Bhutan are: (a) the average consumer's unawareness of the potato's versatility as a nutritious food, and (b) the need for policy makers to consider the potato in food policy deliberations (Poats 1982). At the consumer level, many Bhutanese are unaware of the variety of potato dishes that can be made with readily available vegetables and spices. Rather, they tend to equate potato consumption with consuming "boring" boiled potatoes. Moreover, much could be done to educate the public concerning the nutritive value of the potato. Potatoes need not be considered as merely a second-class complement to rice.

At the policy making level, potatoes have been overlooked as part of a potential solution to the country's food self-sufficiency problems for various reasons. Since Bhutanese prefer rice as a staple food, most potatoes are sold as exports. However, growing awareness about actual and potential levels of potato consumption may lead to a promotional program consistent with the Kingdom's development goals. A key set of issues in these deliberations concern the marketing of Bhutanese potatoes. This report now turns to this subject.

CHAPTER FOUR

Prevailing Marketing Patterns for Bhutanese Potatoes

Introduction

Most Bhutanese potatoes are exported to India, rather than consumed in Bhutan. This, everyone agrees upon. Whether these potatoes are used in India for seed or for table consumption is another question entirely. On that topic no one seems to agree. Not surprisingly, prevailing marketing patterns for Bhutanese potatoes might best be described as highly complex and extremely volatile.

On the one hand, these patterns are complicated because Bhutanese farmers market not only table potatoes, at home and in India, but also seed (common and high quality) for domestic and foreign use. Moreover, some Bhutanese potatoes are marketed by private traders acting independently, others are sold in markets regulated by the Food Corporation of Bhutan (FCB), and still others are sold by the Department of Agriculture (DOA) itself. On the other hand, these patterns are highly volatile because Bhutan's potatoes are marketed in competition with potatoes from several Indian states, whose output varies from year-to-year.

More fundamentally, while most Bhutanese potato exports are sold either as table potatoes or as common seed, the distinction between these two types is often subtle and subject to change. Many consumers and many peasant producers both prefer small potatoes. The former simply buy to eat now what the latter buy to plant later. Furthermore, the same traders frequently sell both types of potatoes simultaneously and, depending on market conditions, charge more or less money for either type of potato.

The purpose of this chapter is to clarify these various distinctions. The chapter initially describes table potato and common seed marketing: producers' domestic sales, exports, and imports. It then examines the improved quality seed potato trade: internal marketing of improved seed potatoes and exports of high quality seed as well. The chapter ends with a special section devoted to potato retailing in Bhutan.

4.1 Marketing Patterns Inside Bhutan for Table Potato and Common Seed Exports

According to the oral tradition, potatoes have been sent from the mountains of Bhutan to the lowlands of neighboring India for decades, if not centuries. Nevertheless, the volume of potato trade only reached conspicuous proportions in the last 5 to 10 years. With increasing interest in potato exports and a growing number of local weekly fairs, potato marketing patterns have evolved accordingly. In particular, these patterns have taken on distinct regional characteristics.

(i) Western Hills Region

Most of the marketable surplus of potatoes is produced in the Western

Hills region (see Table 3.1). Within this region, potatoes are shipped primarily from farms in and/or around Chapcha, Paro, Thimphu and Wangdi.Growers around Chapcha have been selling potatoes in India for decades. They first hauled them down by mule and, later, when the road opened, by truck. Chapcha potatoes have developed a reputation for superior taste among Indian traders. Over the years as a result, potatoes from this area reportedly receive a premium price in India.

According to Chapcha farmers contacted for this study, area growers first produced a white-skinned Indian potato. They now grow some red-skinned potatoes as well because they get a better price. Most Chapcha potatoes are harvested in August and September through a system of labor exchange. They then are hauled in split bags to the road where they are combined into large sacks for transport to Phuntsholing.

Chapcha farmers prefer to sell their potatoes themselves at the border. Even if they have relatively few potatoes, individual Chapcha growers collectively hire a truck to be able to go to Phuntsholing in person. The need to buy provisions is the reason for this preference. Only a few Chapcha potato farmers sell their surpluses to other farmers or keep some for local retail sale.

Potato marketing in the Paro valley is divided into two crops. The early, irrigated crop is marketed in June-July. The late, dry land crop is sold in August-September. Since many farmers in Paro are also profit conscious businessmen, they sell some potatoes at both times to spread out their risk and to reduce their labor requirements at harvest. Paro potato growers also divide their production between Swiss Red, Cosima, and Maritta varieties. In 1982, Swiss Red potatoes produced in Paro received a premium price in Phuntsholing. These potatoes sold for 117 to 150 *rupees* per quintal vs. 100 to 127 *rupees* per quintal for the higher yielding, white-skinned varieties.

Although several of Paro's largest farmers market a truckload (7 tons) or more of potatoes at a time, most growers in this region sell from 100 to 2,500 kilograms per sale in Phuntsholing. However, small Paro farmers sell their few sacks of surplus potatoes locally. Some sell their potatoes to trucker/trader/large farmers, who steadily assemble loads of potatoes for eventual sale in Phuntsholing. Others barter their harvest for dry goods in the community's retail shops or they sell directly to consumers, for example, at nearby Indian army camps.

A number of communities produce and market potatoes in the vicinity of Thimphu, the capital city. Growers interviewed near Jemina sold mostly red-skinned potatoes at the end of August or during September. Growers in these places tend to sell their potatoes to local traders for resale in Phuntsholing for various reasons: they sell only a few bags of potatoes; transportation to market is difficult to secure; and local retail trade is saturated by many small lots of potatoes.

The villages of Yoesepang and Hongtsho are also near Thimphu. Several potato farms in these villages are managed in absentia by civil servants or businessmen living in the capital. Given their proximity to Thimphu and their location adjacent the main highway, rainfed potato farms in this area are readily accessible by truck. The largest of these

operations markets up to 20 tons of white-skinned potatoes a year. The farmers (or their employees) from these villages sell their potatoes in Phuntsholing from August to October.

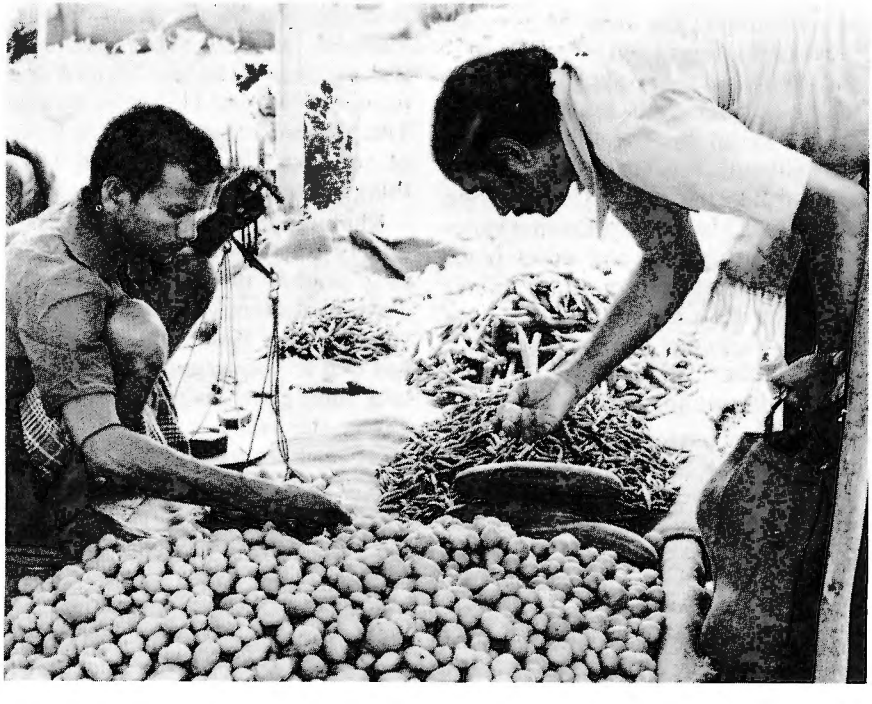
Potato farmers in these communities also sell a small part of their harvest in local retail shops or the Thimphu Sunday fair. Their stock of stored potatoes serves as sort of a bank account in these instances. Whenever they need to make a purchase, they draw out some of their potatoes and sell them. Other farmers acknowledged as well that they occasionally gamble a little on potato price movements. If they think potato prices will go up, then they hold back their small supplies for later sale.

A small scale/large scale dichotomy characterizes field-to-market potato movements in the Wangdi-Phubjikha area. Some farmers sell or barter small lots of potatoes in the Wangdi shops or to retailers who visit their farms. Large farmers in the Phubjikha valley ship their truckloads of potatoes straight to Phuntsholing. The FCB depot in Phubjikha purchased about 180 tons of potatoes from local growers in 1982. But, as in other areas, most farmers sold on the open market at well above the FCB support price.

(ii) Eastern Hills Region

In the Eastern Hills region, principal commercial potato production centers are Bumthang, Yungphula/Kanglung, and Khaling. Bumthang potato producers market primarily white-skinned hybrids from the end

Consumer selecting table potatoes in Galeyphug market. Note small size of tuber. (Photo by Poats)



of August to mid-October. In contrast to producer potato marketing in Western Bhutan, most Bumthang growers do not travel to the border to sell their crop. Several reported being unable to write or to perform simple calculations. So, they are reluctant to trade with Indian border merchants directly. However, Bumthang has no retail stores as in Paro, Thimphu, or Wangdi, nor does the area have a Sunday fair. Consequently, all the marketed table potatoes are exported through local traders. One Bumthang trader in particular handled 70 to 80 truckloads in 1982. This trader operates out of a tiny dry goods shop in Bumthang itself. He and his wife provide cash advances to about 30 or 40 growers. The couple also supplies farmers with sacks, thread and needle for bagging potatoes.

Ura is about 40 kilometers from Bumthang, on the road to Mongar. Lack of transportation hampers potato marketing in this area. As a result, most Ura growers sell either to contractors from Bumthang who have their own trucks or to the town's FCB depot. Local retail potato trade is virtually non-existent. Most growers around Bumthang and Ura cultivate Swiss Red, Maritta and Cosima varieties. Potato marketing takes place from late August to mid-November. Still, outsider's interest in Ura's crop usually picks up in late September and October, once all the potatoes around Bumthang have been sold.

Producer potato marketing in the Yungphula/Kanglung region is unusual in at least two respects. First, growers there harvest their potatoes in July-August, but (in 1982) sell about half in October-November. Second, they separate their potatoes by size. The larger potatoes sell as ware in July-August. The smaller ones as seed in late October-November. Farmers delay their potato sales because of several, different factors. Prices may be down in July-August. Rainy weather may discourage buyers from purchasing wet potatoes at harvest time. In any event, Yungphula/Kanglung farmers generally market white varieties themselves in S./Jongkhar. These growers sell their potatoes for cash and use the proceeds to purchase provisions. The typical sale is 1 to 3 tons.

Along with Chapcha in the Western Hills region, Khaling is one of the more established potato producing areas in Bhutan (Roddar 1982). Unlike in Chapcha, however, Khaling growers sell some potatoes through local traders/farmers and take some down to the border with India on their own. Three or four traders have their own potato farms as well as shops in Khaling itself. Khaling merchants buy potatoes at harvest in June-July and sell the larger ones immediately as ware. They then keep and germinate the smaller potatoes for sale in October-November as seed. These traders handle from 2 to 6 tons of potatoes a year. They sell everything at the border.

Khaling farmers sell to these local traders for a variety of reasons. Some have neither the spare time to go down to S./Jongkhar themselves nor someone that they can send. Others feel that it is simply uneconomical to take their potatoes to S./Jongkhar. Given the small quantities, travel costs easily exceed any difference in potato prices between Khaling and the border.

(iii) Southern Foothills Region

Table (and seed) potatoes sent down from the Bhutanese highlands go as far as the border to be sold. Bhutanese generally are reluctant to

sell their potatoes in India for several reasons: many cannot speak the language; most are unfamiliar with Indian markets; and, they express concern about being robbed. Under these circumstances, the most important border potato market in Bhutan is Phuntsholing. Potatoes from all over the Western Hills as well as some from Bumthang in the Eastern Hills are exported through this city. Some table potatoes are imported through Phuntsholing as well.

Eight Phuntsholing licensed traders—one Bhutanese and seven Indian—export potatoes to India from about mid-June to mid-November. During August 1982, Phuntsholing exported about 200 tons of potatoes per week. Most of these merchants have been in potato marketing for several years, but all seem to look on it as a part-time business. Several operate dry goods shops. Others buy and sell various products, not just potatoes.

Phuntsholing traders buy Bhutanese potatoes in the FCB-organized auction yard. Up until August 1982, these merchants brought directly from individual growers or rural assembler/traders. Now, all potatoes, except high quality seed, leaving Bhutan via Phuntsholing must be purchased in the FBC auction. This practice is enforced by a system of export permits for trucks carrying produce across the border.

The FCB auction convenes every day of the week except Tuesday at the FCB godown. Potatoes that arrive one day are auctioned the next morning in separate lots. Only the eight licensed traders are allowed to buy potatoes. However, these merchants must attend every auction.

Before bidding begins on each lot, several bags are opened to enable traders present to personally inspect the quality of the potatoes. Bidding then starts at the current FCB support price (see Chapter Five) and goes up. Each trader simply calls out the price that he is willing to pay.

Phuntsholing traders bid 20% to 30% more for red-skinned potatoes in 1982. They generally make higher bids for small, oval, white-skinned potatoes than for large, round potatoes of the same color. Phuntsholing potato merchants bid less for mixed lots of different color, different size, different quality potatoes. They find that poorly graded Bhutanese potatoes are harder to sell in the highly competitive Indian market. The traders claim that these characteristics merely reflect the preferences of Indian consumers in northern West Bengal.

Auction rules allow the seller to accept or reject the closing price bid for his potatoes. If the seller accepts the closing price bid, then the sale is finished. FCB personnel weigh the potatoes in the afternoon. The trader then pours them into his own bags and hauls them to his godown. FCB personnel usually collect payment for the potatoes within 48 hours. The farmer can then receive his money. (Potatoes purchased by the FCB at the Phubjikha depot are also sold in the Phuntsholing auction yard). If a seller rejects the closing price bid, then his potatoes are stored overnight and re-auctioned the following morning. This last year, all the weighing, accounting, and storing was provided free as an incentive to sellers to use the auction.

Potato traders in Phuntsholing generally ship Bhutanese table potatoes to commission agents in Alipur-Duars, Coochbehar, Jalpaiguri, Siliguri and much less frequently Calcutta.

These shipments normally involve only fresh table potatoes, sold on short-term credit. Although some traders occasionally separate tiny potatoes for sale as seed, they maintain that these represent a minor percent of their total sales volume. Similarly, while every Phuntsholing potato trader either owns or rents a godown, none has any refrigerated storage space. They argue unanimously that storing Bhutanese potatoes makes no sense. For short time periods of 1 or 2 weeks, it is unnecessary. They can simply keep the potatoes in their godown. For longer periods of several months, it is uneconomical. Potato prices start to fall in November as the new Indian crop comes on the market.

Beginning in late December, Phuntsholing potato traders sell imported table potatoes to retailers from Paro and Thimphu. These are fresh, cheap white-skinned potatoes from India. They usually sell on a cash basis to retailer/traders from Paro and Thimpu. Some of these same retailer/traders supply Phuntsholing merchants with potatoes during the Bhutanese harvest. Most Phuntsholing traders reported selling about 5 or 6 of the 70 kilogram bags of Indian potatoes per week in the off-season.

Some Bhutanese table potatoes also are exported through Galeyphug. While plans are to open an auction yard there, most potatoes sold in Galeyphug in 1982 went through three or four resident Indian traders. These merchants operate dry goods shops on or near the main square. They trade potatoes on a part-time basis using rented facilities for that purpose.

Galeyphug traders purchase Bhutanese potatoes from growers, rural assemblers and the local FCB depot. The FCB Galeyphug received about 150 tons of potatoes from the highlands, primarily Ura, during 1982. Galeyphug traders generally pay cash and only rarely barter for potatoes. They prefer to purchase small to medium sized, cylindrical shaped, white-skinned potatoes. They pay less for large, round potatoes or for potatoes covered with dark, grayish soil. They buy Bhutanese potatoes mostly during September and October. Local FCB officials estimate that these traders exported about 1,500 tons of potatoes in 1982.

Galeyphug traders sell primarily to potato merchants in Bongaigoan. They also sell to the dozen or so local vegetable retailers. These sales are frequently on credit. Galeyphug merchants do not re-grade or re-package Bhutanese potatoes, but sell them in the form that they are received. Most sales take place in Galeyphug itself. On occasion, Galeyphug traders transport potatoes to Bongaigoan or even to Alipur-Duars and Siliguri. However, they are reluctant to do this. Aside from the added expense and inconvenience, one trader claims that he was cheated on previous trips. In any event, Galeyphug traders take turns visiting Bongaigoan every day to monitor regional potato price movements.

From December to July, Galeyphug traders import Indian table potatoes. They sell 90% of the estimated 5 tons of imported potatoes that they market per month in Galeyphug itself. Few Indian table potatoes are shipped up to Shemgang, Tongsa, or Bumthang.

Potatoes produced in Mongar, Pemagatsel, Khaling and Yungphula/Kanglung are sold in S./Jongkhar. While the FCB has a depot in this border town, it handled less than a ton of potatoes in 1982. S./Jongkhar has no auction yard. Instead, Bhutan-

ese potato exports go through about six local Indian traders. Some of these merchants have shops and/or godowns in S./Jongkhar. Others have godowns across the river in the Indian village of Melabazaar. One or two S./Jongkhar traders have some type of facility in both places. Still, all buy Bhutanese potatoes in S./Jongkhar for later sale to India. One trader reportedly exported about 500 tons of potatoes in 1982.

Traders in S./Jongkhar (and Melabazaar) buy Bhutanese potatoes from producers and rural assembler/traders who truck their crop down to the border themselves. Bargaining then frequently takes place at the S./Jongkhar truck stop or at a nearby trader's godown. Negotiations usually revolve entirely around the selling price. Once an agreement has been reached, the potatoes are unloaded at the seller's expense and weighed using the buyer's scale. The standard procedure is to pay cash and for the seller to receive his bags back. Traders provide no advances either in money or in kind.

S./Jongkhar traders pay the same price for a red- or a white-skinned table potato. But they do offer more money for a small, cylindrical potato than for a large, round one. These traders acknowledge that they normally re-grade Bhutanese potatoes. They claim that this re-garding is necessary to compete with well-graded Indian potatoes. Larger potatoes sell as ware, smaller ones as seed. According to S./Jongkhar merchants, demand for table potatoes is strongest in August-September. At that time, prices are higher for medium sized potatoes and lower for smaller, seed-size tubers. The market for seed potatoes peaks in October to early November. During these later months, prices for seed are generally higher than for table potatoes. At least one trader in S./Jongkhar keeps small potatoes in his godown for 1 or 2 months before selling them as seed.

S./Jongkhar traders sell most of their potatoes for cash, a few bags at a time. Their principal buyers are itinerant Indian merchants who frequent weekly markets in Assam. S./Jongkhar traders also supply some potatoes to vegetable vendors in S./Jongkhar itself. One particular trader provides 4 or 5 tons of common seed to the local DOA extension officer.

Potato traders in S./Jongkhar import few Indian potatoes in the off-season from January to May. Based partly on conversations with retailers in Tashigang and Khaling, S./Jongkhar traders handle only 1 or 2 tons of imported potatoes per month.

4.2 Marketing Patterns for Bhutanese Table Potato and Common Seed Exports in India

Most Bhutanese potato exports to India are marketed in nearby northern West Bengal and Assam. No definitive official statistics exist to support this observation. It is based on informal interviews with potato traders in Bhutanese border towns, in Delhi, and in Calcutta. It also makes good economic sense. On the one hand, potatoes are a semi-perishable commodity relatively expensive to transport. Shrinkage losses in transit and a high ratio of freight charges to final selling price mean potatoes can be sold most profitably near production centers. On the other hand, some potatoes from as far away as Uttar Pradesh are marketed in northern West Bengal. In this instance, however, considerably lower unit production costs apparently make Uttar Pradesh potatoes, delivered in West

Bengal markets, as cheap as those produced nearby. Available data suggest that Bhutan's potatoes have a competitive edge in adjacent Indian states in spite of high or higher production and transportation costs. The reasons why Bhutanese potatoes can compete in these markets are: (a) they have a distinctive taste which Indian consumers in this region like, and, (b) they are sold principally from mid-August to mid-October when there are few local fresh potatoes available. Given the importance of the quantity and timing of Indian potato production for Bhutanese potato marketing, the report turns briefly to this topic.

(i) Indian Potato Production and Bhutanese Potato Marketing

The quantity and timing of Indian potato production has a major, if not decisive, influence on Bhutanese potato marketing. This influence is transmitted through national, regional, and local Indian potato developments. At the national level, India is now recognized as among the 10 largest potato producing countries in the world (CIP 1982). During the period 1963/64 to 1978/79, national potato production increased spectacularly from 259,000 tons to more than 10 million (Srivastara 1980). Estimated average yields per hectare in India in 1980 were 12 tons (vs. 6.2 tons in 1981 for Bhutan).

While at least some potatoes are cultivated in India year 'round, nearly 90% of total production is grown during the winter months. Most potatoes, then, are harvested from November to March. Given the seasonal glut and associated collapse in farm gate prices, it becomes temporarily economical to dispatch potatoes from the major production zones to centers of strong demand, even over considerable distances. As a result, some potatoes, for example, harvested in Uttar Pradesh in January are sent across northern India for sale in or near Bhutan. Potatoes not sold at harvest time go into cold stores. India had an estimated cold storage capacity of 3.3 million tons in 1979, or roughly one third of total production (Srivastara 1980).

From the regional perspective within India, three states cultivate more than 70% of all the hectares planted in potatoes: Bihar, Uttar Pradesh and West Bengal (see Table 4.1). West Bengal, in particular, had one of the fastest increases in area planted in potatoes of any state in India from 1963 to 1979. Estimated annual average growth rates in West Bengal's potato production and productivity from 1960/61 to 1978/79 were equally impressive, (see Table 4.2). Factors cited as having contributed to these

Potato retailing in Sarbhang. (Photo by Poats).

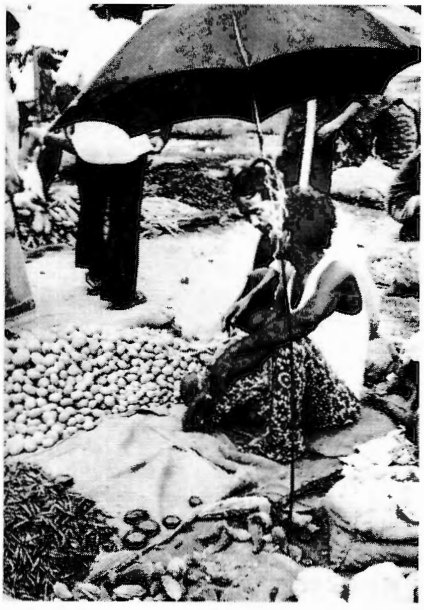


Table 4.1 India: Area under potatoes by states 1963/64 to 1978/79.

State	1963-64		1968-69		1973-74		1978-79	
	000 ha.	%	000 ha.	%	000 ha.	%	000 ha.	%
Andhra Pradesh	1.1	0.26	0.6	0.11	0.5	0.09	0.3	0.04
Assam	36.2	8.72	39.8†	7.59	28.8	5.30	34.8	4.40
Bihar	82.2	19.80	109.3	20.84	106.2	19.54	141.6	17.92
Gujarat	2.3	0.55	3.8	0.72	3.6	0.66	10.5	1.33
Haryana	*	—	4.3	0.82	8.1	1.49	14.8	1.87
Himachal Pradesh	12.6‡	3.04	16.0	3.05	14.7	2.70	13.6§	1.72
Jannu & Kashmir	0.7	0.17	1.4	0.27	1.7	0.31	2.6	0.33
Karnataka	7.7	1.86	8.5	1.63	11.5	2.12	9.8	1.24
Madhya Pradesh	13.3	3.20	18.4	3.51	18.6	3.42	21.0	2.66
Maharashtra	14.9	3.59	12.6	2.40	13.1	2.41	10.9	1.36
Manipur	—	—	—	—	2.3	0.42	2.2§	0.28
Meghalaya	—		—	—	16.9	3.11	18.0	2.28
Nagaland	—	—	—	—	3.5	0.64	3.0	0.38
Orissa	29.4	7.08	28.7	5.47	5.3	0.97	8.5	1.08
Punjab	16.1‡	3.88	11.0	2.10	23.1	4.25	36.4§	4.61
Rajasthan	1.7	0.41	1.9	0.36	2.4	0.44	2.9	0.37
Tamil Nadu	6.4	1.54	12.6	2.40	12.3	2.26	13.6	1.72
Tripura	2.4	0.58	2.8	0.53	2.8	0.51	2.3	0.29
Uttar Pradesh	122.2	29.45	173.8	33.14	187.0	34.41	281.3	35.59
West Bengal	65.6	15.81	78.6	15.00	80.5	14.81	161.5	20.44
Delhi	0.2	0.05	0.3	0.06	0.3	0.05	0.2§	0.03
Mizoram	—	—	—	—	0.2	0.04	0.5§	0.06
India	415.0	100.00	524.4	100.00	543.4	100.00	790.3	100.00

Source: Directorate of Economics and Statistics, Ministry of Agriculture and Irrigation, Government of India, as cited in Srivastava, 1980.

* Included in Punjab.

† Dates relates to Assam (at present) and Meghalaya and Mizoram.

‡ Related to set up before November 1966.

§ Relates to 1977-78.

Table 4.2 West Bengal: Area, production, and average yields for potatoes for selected years, plus respective compound growth rates.

	Area (000 ha.)	Production (000 tons)	Yield (kg./ha.)
Years			
1960-61	58.6	579.1	9882
1970-71	65.1	929.7	14281
1978-79	159.6	2433.5	15247
Compound Growth Rates			
1960-61 to 1978-79	4.1	6.8	2.6
1970-71 to 1978-79	11.1	12.8	1.9

Source: Chowdhury and Sen, 1981.

growth rates include: (a) the expanded area in irrigated potato production; (b) introduction of shorter duration paddy, freeing more land for other crops, including potatoes; (c) construction of additional refrigerated storage facilities to absorb seasonal potato surpluses; (d) use of improved higher yielding seed varieties, and, (e) steady increase in potato prices inducing previously marginal areas to cultivate this crop (Chowdhury and Sen 1981). The last two factors confirm that WestBengal producers and consumers have a growing interest in both seed and table potatoes. Given the strong increase in demand, more isolated production zones, such as Bhutan, can profitably produce and market potatoes for this region.

Timing is also a factor in the regional context. The peak potato harvesting period in West Bengal is January and February. Fresh potatoes are marketed from late November to the end of March. Stored potatoes are sold from April to the lean period of September-October. The evolution of wholesale potato prices in Calcutta reflects this well-established pattern of potato supply, (see Table 4.3). From 1960 to 1980, potato prices generally were lowest in January and February at the peak of harvest, and highest in September and October right before the new crop comes in. Moreover, a recent study observed that the seasonal spread between post-harvest and lean period prices in West Bengal actually has increased over the last 20 years, (Chowdhury and Sen 1981). Consequently, Bhutanese potatoes find a ready outlet in West Bengal precisely because they reach the market at a time of temporary scarcity.

At the local level, the quantity and timing of potato production in Coochbehar, Darjeeling, and Jalpaiguri also influence Bhutanese potato marketing. For example, over the last 2 decades, Darjeeling is the only district in West Bengal to show a decline in potato production (see Table 4.4). Seed potatoes once produced and shipped by Darjeeling growers now are supplied by farmers in other areas, e.g. Himachal Pradesh. Interest in Bhutanese seed potatoes probably stems in part from the shortage of Darjeeling-produced seed. Moreover, potato production in these northern districts is split between the early crop, planted August-October, and the late crop, planted November-January. Bhutanese potatoes thus are harvested when the demand for seed is highest and the supply of locally-produced fresh potatoes is exhausted. Lastly, a relative shortage of cold store facili-

Table 4.3 Calcutta: Average monthly wholesale prices for potato, 1960-1980. (*Rs*. per quintal).

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Spt.	Oct.	Nov.	Dec.	Avg.
1960....	26.00	23.33	25.33	26.67	34.67	36.00	44.00	37.33	44.00	48.00	37.33	28.00	34.37
1961....	20.10	16.08	21.44	30.00	37.00	48.50	52.40	61.70	50.30	80.40	74.40	64.50	46.40
1962....	31.60	22.80	28.20	37.80	40.20	45.60	53.60	50.90	56.40	58.90	45.60	29.50	41.76
1963....	22.80	20.10	27.20	28.00	28.20	32.20	34.90	43.00	36.30	41.60	43.00	51.18	33.68
1964....	23.00	29.00	40.50	52.60	58.90	60.00	65.00	75.20	88.60	91.30	94.00	42.50	65.76
1965....	34.40	47.50	52.50	47.50	51.20	72.50	75.00	70.00	68.75	66.25	46.25	48.75	56.72
1966....	33.75	35.00	37.50	42.50	43.75	56.25	60.00	60.50	62.50	83.75	85.00	55.00	54.58
1967....	43.75	57.50	67.50	80.00	85.00	92.50	93.75	100.00	107.50	112.50	112.50	90.00	86.88
1968....	50.00	62.50	68.75	72.50	82.50	87.50	85.00	85.00	85.00	72.50	66.25	45.00	71.88
1969....	32.50	36.25	38.75	50.00	58.75	59.00	60.00	62.50	70.00	75.00	87.50	77.50	58.98
1970....	40.00	55.00	67.50	77.50	102.50	97.50	97.50	97.50	110.00	122.50	105.00	110.00	90.21
1971....	52.50	57.50	60.00	53.75	60.00	80.00	72.50	80.00	80.00	82.50	75.00	82.50	69.69
1972....	50.00	52.50	47.50	55.00	82.50	83.75	85.00	87.50	87.50	90.00	85.00	45.10	70.94
1973....	47.50	60.00	75.10	82.50	97.50	97.50	102.50	95.00	98.25	122.50	105.00	92.50	89.64
1974....	70.00	77.50	92.50	92.50	112.50	115.00	117.50	115.00	117.50	122.50	95.00	85.00	101.04
1975....	55.00	60.00	55.00	61.25	90.00	92.50	87.50	88.75	92.50	110.00	117.50	72.50	81.88
1976....	50.00	55.00	75.00	85.00	102.50	105.00	107.50	107.50	125.00	120.00	120.00	70.00	87.77
1977....	62.50	70.00	77.50	105.00	120.00	120.00	120.00	112.50	120.00	130.00	180.00	152.50	114.17
1978....	72.50	85.00	77.50	85.00	85.00	112.50	112.50	117.50	125.00	130.00	95.00	70.00	97.29
1979....	52.50	50.00	45.00	50.00	90.00	95.00	92.50	90.00	85.00	87.50	90.00	119.00	78.88
1980....	65.00	58.00	80.00	110.00	130.00	145.00	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..

Source: Chowdhury and Sen, 1981.

Table 4.4 West Bengal: Potato production in different districts, 1960/61 to 1978/79, (000 tons).

Year	Burdwan	Birbhum	Bankura	Midna-pore	Howrah	Hooghly	24 Parga-nas	Nadia	Murshi dabad	West Di-najpur	Malda	Jalpai-guri	Darjee-ling	Cooch-behar	Purulia
1960-61	144.4	51.1	15.7	43.2	9.7	217.8	13.8	1.7	25.1	16.8	5.6	10.2	16.8	7.3	0.4
1961-62	137.8	77.7	16.4	66.0	9.5	324.4	13.0	1.2	18.7	20.3	6.2	13.6	16.8	9.8	0.2
1962-63	198.1	31.5	13.3	74.3	16.9	354.4	16.2	2.2	25.8	17.5	4.8	16.7	15.8	10.6	0.4
1963-64	127.0	38.0	14.1	84.4	12.0	180.6	13.5	1.7	17.9	13.7	2.8	7.2	18.9	3.7	0.4
1964-65	195.5	51.2	18.8	88.0	23.5	293.1	21.6	4.7	37.9	15.5	6.1	12.3	20.6	5.2	2.5
1965-66	192.2	59.0	24.0	107.9	22.3	311.6	38.1	6.3	39.6	16.9	3.8	9.5	18.1	8.9	1.5
1966-67	146.5	44.6	21.9	90.7	16.8	202.6	25.2	4.5	36.0	15.9	4.4	7.7	16.0	7.3	1.9
1967-68	153.7	47.7	23.2	95.0	20.0	88.0	30.4	3.5	34.6	14.3	4.3	5.7	14.4	5.3	2.5
1968-69	181.9	62.2	36.4	114.9	19.0	297.3	36.6	4.5	48.7	22.7	5.0	5.5	11.4	8.3	5.3
1969-70	114.5	38.6	38.8	90.8	28.3	193.7	27.1	3.1	27.1	15.3	2.6	5.3	11.6	6.1	4.7
1970-71	256.1	55.8	43.9	134.0	29.1	282.6	32.4	3.3	38.2	17.3	4.1	7.0	11.7	9.3	4.9
1971-72	206.5	87.6	60.0	139.0	35.7	408.2	34.6	4.6	43.9	10.0	2.3	4.0	10.9	4.4	8.1
1972-73	220.6	48.9	39.8	124.7	30.2	324.6	46.2	10.0	49.1	22.0	3.9	4.9	10.6	7.8	5.5
1973-74	194.0	47.7	39.7	119.3	30.8	383.2	32.6	9.2	52.2	24.0	3.4	4.3	15.8	5.6	3.5
1974-75	408.8	72.8	53.4	111.3	19.8	485.6	32.6	19.4	90.5	20.2	5.1	8.5	14.1	7.6	5.2
1975-76	421.4	77.0	67.8	217.6	51.7	448.4	62.4	41.4	86.5	46.4	11.2	22.5	21.9	24.9	14.4
1976-77	424.0	87.9	63.5	231.9	59.4	440.9	71.9	45.0	94.9	42.8	19.4	20.0	12.1	26.7	9.6
1977-78	447.0	90.9	90.4	256.7	66.7	567.0	70.8	53.0	82.7	60.4	24.0	28.2	14.6	34.4	14.1
1978-79	574.5	90.1	137.8	304.8	91.3	732.6	95.6	70.1	108.0	86.8	20.2	39.3	14.5	50.8	17.1

Source: Chowdhury and Sen, 1981.

Table 4.5 West Bengal: Distribution of total potato production, cold stores and their capacity by district, 1980.

District	Potato Production % of total*	Cold stores No.	Cold stores % of total	Capacity Tons	Capacity % of total	Capacity as % of total prod. in each dist.
Calcutta	....	26	12.4	42,654	4.4	...
24-Parganas.....	3.9	6	2.9	9,252	1.0	9.7
Howrah	3.8	9	4.3	22,268	2.3	24.4
Hooghly.....	30.1	67	31.9	406,139	41.8	55.4
Burdwan.....	23.6	55	26.2	291,867	30.1	50.8
Birdhum.....	3.7	11	5.2	25,180	2.6	27.9
Bankura	5.7	7	3.3	26,747	2.7	19.4
Midnapore.....	12.2	22	10.4	135,708	14.0	44.5
Nadia	2.9	...	...	...	...	...
Murshidabad.....	4.4	6	2.9	10,116	1.0	9.4
Jalpaiguri.....	1.6	1	0.5	903	0.1	2.3
Coochbehar.....	2.1	...	...	...	...	...
W. Dinajpur.....	3.6	...	...	...	...	...
Malda.....	0.8	...	...	...	...	...
Darjeeling.....	0.6	...	...	...	...	...
Purulia	0.7	...	...	...	...	...
Total	100	210	100.0	970,834	100.0	39.9

Source: **Chowdhury and Sen, 1981.**

*Percent of total potato production in West Bengal produced by each district.

ties in these districts (see Table 4.5), means district markets are dependent on potatoes shipped in from other areas, such as Uttar Pradesh, southern West Bengal, Bhutan. The next section examines the flow of Bhutanese table potatoes and common seed into these districts.

(ii) Marketing Patterns for Northern West Bengal

Principal outlets for Bhutanese potatoes in northern West Bengal are Alipur-Duars, Coochbehar, Jalpaiguri and Siliguri. Merchants in the three former cities sell potatoes to both local urban residents and adjacent farm families. In contrast, Siliguri serves primarily as a trading center for potatoes and a variety of other products produced in India, Nepal, Sikkim and Bhutan.

Being the nearest major urban area to Phuntsholing, Alipur-Duars is probably the most important single outlet for Bhutanese potato exports. Three or four veteran traders sell potatoes there. They each have a small shed located on Station Road in the center of the city, adjacent to the main retail market. Unlike most potato traders in Bhutan, these merchants deal almost exclusively in potatoes (both seed and ware) and onions and specialize in these commodities year 'round. Moreover, Alipur-Duars traders are commission agents. In other words, they sell potatoes for a fixed percentage (4% to 5%) or commission, rather than buying them outright for re-sale at their own risk. Several years ago, in fact, one or two of these traders sold Bhutanese potatoes on a commission basis for the FCB.

Alipur-Duars traders handle table potatoes from all over India, Assam, Uttar Pradesh (via Siliguri) as well

as from Bhutan. Most Bhutanese potatoes shipped to Alipur-Duars (estimated volume 500 tons) are sold as table potatoes in August and September. These potatoes come primarily from Phuntsholing but about 25% to 30% are from Galeyphug (Bumthang). Consumers in and around Alipur-Duars prefer a cylindrical shaped potato. They also will pay a premium, of 10 to 15 *rupees* more per quintal for potatoes from Chapcha. All other things being equal, red-skinned varieties sell for more money than white-skinned potatoes.

These same Alipur-Duars traders also market an estimated 50 to 60 tons of Bhutanese seed. Bhutanese seed sales, however, are strongest from November to January for the second local crop. The reason for the smaller volume, delayed sale of Bhutanese seed is that time is necessary between harvest and planting to break dormancy. Hence, when most seed is needed for the early first crop, Bhutan's potatoes are not germinated. Seed for this crop comes from cold stores in other states in India or from the Burdwan district of West Bengal (see section *Marketing Bhutanese Improved Potato Seed* below).

Coochbehar handles about the same total volume (400 to 600 tons nearby Alipur-Duars. Two or three commission agents dominate potato trade there. One of these traders sold potatoes for a commission on behalf of the FCB in past seasons. This trader has a small, simple stall among the maze of passageways and shops that constitute Coochbehar's central bazaar. At the time of this study, he had 14 to 16 quintals in stock. He handles only Bhutanese table potatoes because he has insufficient stall space to market both table potatoes and seed. (A farm supply dealer in Coochbehar markets high quality Bhutanese seed (see section *Marketing Bhutanese Improved Potato Seed*). This merchant brings about 150 tons of potatoes from Bhutan a year, during September and October. At other times of the year, he markets potatoes from Calcutta (January onward), Siliguri (year 'round), and Shillong via Gawahti (June to August).

Coochbehar consumers prefer red potatoes over white-skinned varieties. However, the difference in price is rather small, about 5 *rupees* per quintal or 185 vs. 180. Still, they will pay 10 to 15 *rupees* more for Bhutanese red-skinned potatoes vs. Indian red-skinned varieties. Retailers also like potatoes that have been well graded. The commission on wholesale potato sales in Coochbehar reportedly is 3% to 4%.

Three or four traders market potatoes as commission agents in Jalpaiguri. They operate out of a cluster of bamboo huts set off by themselves a few yards from the river in Din Bazaar in the heart of the city. These merchants procure most of their potatoes on credit in adjacent (40 kilometers) Siliguri. Local retailers also buy direct from Siliguri from time to time. As such, Jalpaiguri is more a satellite market of Siliguri than an independent trading center as Alipur-Duars or Coochbehar. Still, Jalpaiguri traders also purchase potatoes on credit direct from Phuntsholing from time to time.

Jalpaiguri traders report that Bhutan has "best quality, more tasty" table potatoes. However, Bhutanese potatoes tend to be up to 20 to 25 *rupees* more per quintal in Jalpaiguri. Therefore, they have difficulty competing with cheaper Indian potatoes. Jalpaiguri traders do not mar-

ket Bhutanese seed. Rather, they sell Bhutanese table potatoes to local retailers and to small scale merchants in outlying villages. Their gross marketing revenue is about 10 to 15 *rupees* out of a wholesale table potato price of 160 to 180 *rupees* per quintal.

Siliguri is the potato marketing crossroads from northern West Bengal. Potatoes from all over India, Nepal, Sikkim, and Bhutan pass through this trading center. An estimated 20,000 tons of table potatoes were shipped there in 1981 (Rao, et al 1982) and another several thousand tons of seed (see section *Marketing Bhutanese Improved Potato Seed* below). In short, potatoes are big business in Siliguri.

Fourteen potato traders work as commission agents in Siliguri. As do their counterparts in other markets in India, they buy and sell onions as well. Most operate out of their own godown. This facility may consist of either rooms in a regular building converted into simple storage space or a larger building that serves as a warehouse for keeping potatoes temporarily between shipments. These traders also rent space in the city's two cold stores. The estimated storage capacity for potatoes is 2,000 tons.

Siliguri traders have perhaps the clearest understanding of potato flows into the region. They indicate that Bhutan's table potatoes compete primarily with cold store potatoes from Bihar and Uttar Pradesh as well as with fresh potatoes from Shillong (see Table 4.6). Siliguri traders also observed that potato supplies in 1982 were down relative to 1981 and prices were up.

Weighing potatoes for retail sale in Thimphu Sunday market.

Table 4.6 Siliguri: Timing of table potato shipments.

Shipping Point/Type of Potato	Fresh	Cold Store
Bihar	December to April	June to December
Burdwan/Calcutta	January to May	June to November*
Delhi	November to December	June to December*
Nepal	Nothing	Nothing
Meghalaya (Shillong)	June to November	Nothing
Sikkim	May to October	Nothing
Uttar Pradesh	December to May	June to December

Source: Interviews with Siliguri Potato Traders.
*Relatively little.

When Siliguri traders want to purchase Bhutanese potatoes, they do not attend the Phuntsholing auction. Instead, they simply telephone to Phuntsholing merchants. In addition, one Siliguri trader contacted for this study reportedly acts as a commission agent for a trader in Bumthang. He sold about 250 tons for him in 1982. Siliguri's potato merchants also have their own association and have pressured local officials to prevent the FCB from establishing a local sales outlet for potatoes.

Siliguri traders ship table potatoes to Assam, Nepal, West Bengal and indirectly to Bhutan. When the Bhutanese harvest concludes and Phuntsholing traders want to buy Indian potatoes, they call to Siliguri. They do little grading or re-packaging but merely dispatch potatoes in the form that they originally are received. Siliguri potato merchants corroborate the observations of other area traders in reporting that consumers in Alipur-Duars and Coochbehar prefer red-skinned varieties. In contrast, consumers in Assam prefer white-skinned potatoes.

(iii) Marketing Patterns for Assam

Some Bhutanese potatoes shipped through Galeyphug and S./Jongkhar also are sold in Assam. Fewer Bhutanese potatoes go to Assam than northern West Bengal, however, because (a) smaller marketable surpluses are produced in growing areas adjacent Assam (see Table 3.1) and, (b) Assam is nearer to the hilly areas of eastern India that also sell fresh potatoes at this time.

Bongaigoan is the most important marketing outlet in Assam for potatoes sent through Galeyphug. The basic reason for this is that Bongaigoan is the nearest Indian town to the Bhutanese border (see Map 1). Potato trade in Bongaigoan is largely in the hands of two or three commission agents. One of these traders still acts as FCB's sales representative, although he handled only 20 to 30 tons as such in 1982. This trader now procures the bulk of his Bhutanese potatoes from private traders in Galeyphug as well as from a merchant in Bumthang. He trades Bhutanese potatoes from late August to late September. During the last three seasons, he estimated having marketed the following quantities: 1980—100 tons, 1981—70 tons, and 1982—50 tons.

Most, if not all, Bhutanese table potatoes shipped to Bongaigoan are sold to local retailers. Area consumers prefer the taste of Bhutanese potatoes to that of those from Maghalaya (Shillong). They also prefer a small, cylindrical, white-skinned potato covered with reddish brown dust

to a round white-skinned potato covered with blackish gray dust. They apparently associate the blackish gray dust with a bitter taste and poor storability. The difference in wholesale price for these two types of potatoes, may be as high as 30 *rupees* per quintal, or 160 vs. 130.

Farther east along the Bhutan-Assam border, potatoes are sent through S./Jongkhar. They go to daily markets and weekly fairs in neighboring towns and villages. During field work for this study Bhutanese potatoes were seen being sold in Tamul Napur and Rangia. Potato traders in Rangia procure Bhutanese potatoes in several ways.Sometimes they buy them in Malabazaar. On other occasions, they buy them from itinerant traders who visit their shops. Or, they may buy Bhutanese potatoes in outlying Sunday markets for re-sale in Rangia itself. In any event, Bhutanese table potatoes marketed in Rangia face stiff competition from potatoes produced in Shillong largely because the latter are 20 to 30 *rupees* less per quintal.

4.3 Marketing Bhutanese Improved Potato Seed

In addition to table potatoes and common seed, Bhutan produces two types of improved seed. District agricultural officers, the Agri-Horticultural farm at Kanglung and the Swiss technical assistance program at Bumthang all produce improved seed of varying quality mainly for distribution to local Bhutanese potato farmers. These potatoes are one type of improved seed. Furthermore, since 1980 government farms at Phubjikha and Yoeseang have been producing high quality seed potatoes, primarily for export. These potatoes are the second type of improved seed. As in the case of table potatoes and common seed, however, the distinction between these two types of improved seed is not always clear. For example, some lower quality, "high quality" potatoes are sold as improved seed to local growers instead of to growers in India. To clarify these distinctions, this report now considers marketing of Bhutanese improved potato seed, first inside Bhutan and then in northern West Bengal.

(i) Marketing Bhutanese Improved Potato Seed Inside Bhutan

DOA officials report distributing about 600 tons of improved, healthy seed every year (Karmacharya 1981). The DOA authorizes district agricultural officers to conduct seed multiplication programs for their districts. Currently, Bumthang, Lhuntshi, Mongor, Paro, and Tashigang districts have such programs (Roddar 1982). Government farms at Pelela, Phubjikha, and Yoesepang also produce improved seed for the domestic market. Nevertheless, until quite recently no institution has assumed complete responsibility for managing the national distribution of such seed. One major task of the newly created (1981) national potato development program is to coordinate domestic distribution of improved seed.

Improved potato seed is distributed in Paro every year through the district agricultural officer at the government agricultural research station. The station itself produces 5 to 10 tons of improved seed. Shipments from Bumthang meet the remaining district improved seed requirements. The Paro experiment station also distributes Bumthang seed. Improved seed varieties made available include those most popular locally: Swiss Red, Cosima, and Maritta.

Government farms at Yoesepang, Phubjikha, and Pelela produce and

distribute improved seed to potato growers in surrounding villages as well as to district agricultural officers in different parts of the country. In the former case, growers purchase directly at one of these farms. In the latter case, district agricultural officers send requests for given quantities of given varieties to these seed production centers based on requests from farmers in their respective districts. Improved seed is sold to growers for about the cost of production, 100 *Nu.* per quintal in 1981/82. The DOA also absorbs transportation charges in some instances.

As part of the high quality seed export program, government farms in 1982 grew Kufri-Joyti, a white-skinned Indian hybrid. High quality seed is produced at these sites using basic seed imported from Simla, the Indian national potato research center. To meet 1982 export commitments, however, much high quality seed harvested at Yoesepang and Phubjikha was sold to buyers in India (see below). Although plans are to sell the remaining 5 to 10 tons at Yoesepang and 30 to 40 tons at Phubjikha inside Bhutan, many district agricultural officers currently have requested improved red-skinned seed varieties for their growers. Bhutanese farmers who grow table potatoes for export apparently believe that the higher prices for red-skinned potatoes more than compensate for lower yields. This issue needs to be studied.

The Swiss technical assistance project at Bumthang also has a potato seed production and distribution component. For the past 6 or 7 years, improved seed produced in Bumthang proper has supplied the district's farmers and those in other, more distant locations around the country. Recently, emphasis has shifted from the former to the latter. For example, some Bumthang seed goes to the district agricultural officer at Shemgang. In 1982, he requested 5 tons for the foothill planting in October-November. He will need another 11 tons for distribution in the highlands area of his district from January to March in 1983. Bumthang grows mainly Maritta and Swiss Red. Total seed production in Bumthang has averaged over 30 tons the last several years.

S./Jongkhar's district agricultural officer purchased some 8 tons of seed from Yoesepang in 1981. However, aside from the high transport costs and resulting increased price to growers, potato farmers complained about poor germination. Since potatoes are planted in this district in December, the Yoesepang seed may not have had sufficient time between harvest and planting to break dormancy. In any event, plans are to procure all 7 tons of seed potato in 1983 through local or area traders. However, this arrangement implies that the DOA's representative buys table potatoes from Bhutanese growers, at least in some cases through Indian merchants, to re-sell to Bhutanese growers as seed.

The district agricultural officer in Tashigang gets improved seed mainly from the Agri-Horticultural Training Institute in Kanglung. Last year, 19.5 tons of Maritta seed was obtained from the Institute and 500 kilograms from local farmers for re-distribution. This year (1983), about 13 tons will be purchased from the Institute and, perhaps, an additional quantity from Yoesepang.

Two or three years ago, the district agricultural officer in Tashigang also began multiplying improved seed locally. In 1981, 2.5 tons of Kufri-Joyti from Yoesepang were planted on the local government farm. Eight

tons were harvested and 2.5 to 3.5 tons given to farmers to try out in 1982. Plans are to give away about 4.5 tons of Kufri-Joyti and Maritta for planting in 1983.

(ii) Marketing Bhutanese Improved Potato Seed in India

In 1980 the DOA began producing high quality seed for export. Within the DOA, several different, though not necessarily mutually exclusive, reasons are given for this program. One reason given is that Bhutanese growers can then be sure of high, secure prices for their output. The collapse of table potato prices in 1979 frequently is mentioned in discussing this reason. Another reason is the need to exploit Bhutan's comparative ecological advantage to produce clean seed for the Indian plains. In other words, the high altitude makes Bhutan a logical place, from the agronomic perspective, to grow potato seed to sell to lowland growers. A third, less frequently mentioned, reason is the improved seed requirements of Bhutanese growers themselves. Given their degenerated seed, Bhutanese farmers must also have good, clean seed to raise productivity. This seed can be produced locally by the DOA from foundation seed imported from India. In actual practice, priority has been given to the first explanation because establishing markets which ultimately will provide incentives for numerous Bhutanese farmers to grow and/or use high quality seed should be given immediate attention.

During 1981 and 1982, the high quality seed export program produced and exported about 250 tons of Kufri-Joyti. In 1982, production was split between (a) the government farms at Yoesepang and Phubjikha and (b) about 20 registered growers around these two facilities.

The Yoesepang farm itself supplied 12 tons of high quality seed for export out of a total production of 17 tons. The six or seven registered producers with farms in the vicinity of Yoesepang also grew some high quality seed. These growers received improved seed from the program and then were to comply with a series of cultural practices to insure high quality production. Several of these growers, however, failed to follow recommendations. Since the price for table potatoes was relatively high, they simply sold what they produced as ware. At least one grower followed the recommendations but insisted on keeping all the harvest for re-planting on his own farm next year. In the initial years of the project, then, the agreement between the national potato program and the registered growers has been hard to enforce.

The Phubjikha farm produced about 80 tons of Kufri-Joyti in 1982. Ten tons were sold as table potatoes through the local FCB depot. Forty tons were sold to the West Bengal Agro-Industrial Corporation as high quality seed.Remaining potatoes will be available to local growers as improved seed.

After potato seed produced at Yoesepang and Phubjikha are dug, they go through a rigorous grading process. They are graded first in the field, again at the adjacent warehouse, and a third time prior to packing in bags for shipment. Potatoes grown by registered farmers not meeting requisite quality standards at grading time are returned to the owner for sale as ware. Some farmers complain that these odd-sized or damaged potatoes are then hard to sell. Others have tried to pressure DOA personnel to accept all their potatoes as is. These and other entreaties have met

with limited success. Yet, one unanticipated result was that most high quality seed produced by government farms went to complete the shipping requirements of the export contract. Nevertheless, these commitments were met and the program is proceeding as scheduled.

Once potatoes have been graded the last time, they are packed into 80 kilogram bags or 30 kilogram minipackets. These bags have a label on the front identifying the contents as DOA high quality seed. An earlier label, declaring the potatoes to be "certified seed," was abandoned because it was considered misleading. Among other things, certification standards in Bhutan differ from those in India where the potatoes are sold. Government trucks then transport the bags to West Bengal or Phuntsholing for collection by buyers. Labeled bags have an excellent resale demand, for unscrupulous traders can fill them with any type of potatoes, then offer the bag for sale as high quality seed.

West Agro-Industrial Corporation, with headquarters in Calcutta, has purchased about 100 tons of high quality seed from the Bhutanese DOA the last 2 years on an experimental basis. This state enterprise specializes in the provision of inputs to West Bengal farmers, mostly fertilizer. Seed sales are an important, but relatively minor, component of its overall operations. Still, the corporation has had some difficulty in securing sufficient quantities of high quality seed from Indian growers, so it has turned to other sources of supply including Bhutan. The practice has been for the corporation and the DOA to negotiate a selling price in June. Once this is agreed upon, the corporation signs a contract to accept a given quantity of seed and makes an advance payment. It then takes delivery in October and November at selected locations of West Bengal. During the last 2 years, the corporation has been satisfied with the quality of potatoes received and hopes to slowly, but steadily, increase purchases of Bhutanese seed in the future.

A private trader in Coochbehar also purchases Bhutanese high quality seed. He operates a hardware store/farm supply outlet and only sells seed potatoes as a sideline. While this trader pays the same price for Bhutanese seed as the West Bengal Agro-Industrial Corporation, he only makes a deposit in June and provides final payment at the time of delivery in November. He purchased 100 tons in 1981 and 50 tons in 1982. He took fewer potatoes last year because he had to sell some Bhutanese seed on credit in 1981 and is still trying to collect his money. In addition, this Coochbehar merchant sees three major factors limiting the potential market for Bhutanese seed in northern West Bengal. First, of 4,000 hectare of potatoes planted in Coochbehar, about 3,200 hectares are planted in September and 800 hectares in December. Bhutanese seed cannot be harvested, shipped, and germinated in time for the first planting, so it can only be used for the smaller second crop. Second, a government agency must maintain certain quality standards, for example, high quality seed potatoes must be a certain size, but not too big. Growers in northern West Bengal prefer very small seed because of better coverage. The problem is that potato technicians consider such small seed too small to be designated high quality. Third, high quality seed normally is relatively expensive. As long as table potatoes are also expensive, a relatively high

price for good seed presents no problem. However, when table potato prices decline, growers prefer to use common seed because it can cost as little as one-third the price of high quality seed. Bhutanese officials certainly must consider these factors in mapping out a marketing strategy for high quality seed potatoes in the future.

4.4 Potato Retailing in Bhutan

Retail sale of potatoes in local fairs and shops is often overlooked in policy discussions of this crop. This section provides a brief panorama of potato retailing inside the Kingdom to complete its description of marketing patterns for Bhutanese potatoes. Note that potato retailing is largely confined to the Kingdom's towns and administrative centers, such as Paro, Thimphu, Tashigang. Bhutanese producers rarely buy table potatoes to eat.

Nine of the 32 Paro retail shops visited for this study had 20 to 30 kilograms for sale. From June to November Paro shopkeepers buy potatoes from local farmers and/or they sell what they produce themselves. Sales during this period average 20 kilograms/week. From December to March, about five shopkeepers buy Indian potatoes from merchants in Phuntsholing. Average sales during this period are 100 kilograms/week.

Paro shopkeepers sell potatoes along with rice, cloth, and other essentials to construction workers and civil servants. These sales normally are for cash, but most retailers extend some credit to their regular customers. Retail prices are generally higher for red-skinned varieties. In October 1982, the differential was 2.0 *Nu.* per kilogram for red-skinned potatoes vs. 1.5 *Nu.* per kilogram for white-skinned.

Some potatoes also are sold in the Paro Sunday farmers' market. Twenty to 30 vendors were in the market on the day of our visit in late October. Of this group, four farmers were selling potatoes. Each had about 20 to 30 kilograms to sell. Potato prices were identical to those in retail shops.

About 60 retail shops line either side of the main street in the center of Thimphu. Of this total, about 24 were selling potatoes at the time of this study. Thimphu shopkeepers procure potatoes in a combination of ways. During the local harvest, some potatoes come from their own farms. Others are purchased at the shop itself from area farmers (payment may be in cash or kind). A few potatoes are bought in the Sunday farmers' market for resale during the week. From July to November, Thimphu retailers sell 30 to 40 kilograms per week.

About six Thimphu retailers also buy Indian potatoes in Phuntsholing. for re-sale in the capital during off-season. Most of these purchases are for cash. However, at least one retailer gets his potatoes on one-month credit from a Phuntsholing trader. From December to March, Thimphu retailers sell anywhere from 30 to 150 kilograms of potatoes per week.

Thimphu retailers generally sell potatoes to government employees, foreign laborers and expatriate professionals. Almost all sales are for cash. The standard mark-up appears to be 50 *paise* per kilogram. For example, if the retailer buys at 1 *Nu.* per kilogram, then he sells at 1.5 *Nu.* per kilogram. Nevertheless, potato retailing appears to be more a service to customers by providing a full line of items than a highly profitable activity. No pronounced differences in price

exist for red-skinned vs. white-skinned potatoes in Thimphu.

Potatoes are also sold retail in the Thimphu Sunday farmers' market. On the day of our visit, 200 farmers came to the market to sell their produce. Of this group, 24 had potatoes for sale. These potato farmers come from surrounding villages. They normally bring 50 to 60 kilograms of various types and sizes of potatoes all mixed together. They simply display what they have to sell and consumers then choose what they want to buy. On the day of our visit, prices varied somewhat from farmer to farmer, but all were similar to the 1.5 to 2.0 *Nu.* per kilogram being charged in local shops.

In Wangdi six small retail shops sell some potatoes. Some farmers also sell potatoes in the Sunday market. Wangdi shopkeepers usually handle small quantities of potatoes, approximately 20 to 30 kilograms per month. However, one retailer claims selling some 600 kilograms per month. Most potatoes are procured on an exchange in kind basis from local growers. From December to March, at least one retailer buys Indian potatoes for cash in Phuntsholing and sells them in his shop. The standard mark-up is 50 *paise* per kilogram.

Wangdi retailers sell potatoes to laborers, government employees and local schools. Area consumers generally prefer a red-skinned potato. They also prefer a large table potato rather than a small one and are willing to pay 50 to 75 *paises* more per kilogram to purchase this kind of potato.

Two or three shopkeepers in Tongsa and Shemgang also sell potatoes retail. One Tongsa retailer only sells potatoes that he brings from Galeyphug. From December to the end of February his sales average about 110

Consumer buying table potatoes at Chirang market. (Photo by Poats).

kilograms per week. Other Tongsa retailers together sell about 100 kilograms per month. They only buy potatoes from local farmers either in their shop (for cash or kind) or at the Sunday market.Shemgang retailers follow similar practices. One only sells potatoes that he grows himself, about 100 kilograms per season. The other buys and re-sells 10 kilograms per week during the Bhutanese harvest. He gets these potatoes from the highlands. This same merchant then sells twice that amount from January to March. A Galeyphug trader supplies him Indian potatoes at that time.

Eight to 10 produce vendors sell potatoes retail in Galeyphug. These Indian merchants operate out of stalls situated at the weekly Sunday market. They sell potatoes along with various other vegetables and fruits. During the Bhutanese harvest, they buy about 100 kilograms per week on credit from Galeyphug potato traders. They never buy potatoes from Bhutanese farmers. From December to July, they go on buying trips to India to purchase potatoes. Average sales are roughly a quintal per week in the off-season.

Galeyphug produce vendors sell potatoes to both local consumers and subsistence farmers. The former purchase larger potatoes for table consumption all year round.The latter purchase small potatoes for use as seed in October and November. Galeyphug produce vendors generally grade potatoes by size themselves. Some produce vendors keep smaller potatoes in a bag to induce sprouting before marketing as seed. The average difference between buying and selling price for these retailers is 30 to 40 *paise* per kilogram.

Small-scale fruit and vegetable vendors dominate potato retailing in S./Jongkhar. One or two wholesaler traders also sell potatoes retail but this volume seems relatively minor. The six or seven potato/produce vendors are all Indian. They sell potatoes from make-shift stands on the pavement or from more permanent shops off the street. Some vendors buy Bhutanese potatoes from farmers directly. About half purchase their potatoes from the S./Jongkhar traders. All these petty potato merchants buy some Indian potatoes from December/January to April/May. They travel themselves to buy Indian potatoes either across the river to Melabazaar or to more distant Indian markets such as Gawahti.

S./Jongkhar potato vendors sell anywhere from 80 to 160 kilograms per week throughout the year. They do not conspicuously re-grade potatoes by size as do retailers in Galeyphug. Consequently, they appear to sell primarily to local consumers. The average wholesale-retail mark-up in S./Jongkhar is about 30 to 60 *paise* per kilogram. S./Jongkhar retailers have mixed views about prevailing consumer preferences. Some retailers claim their clients prefer red-skinned potatoes. Others feel that consumers are indifferent to the potato's skin color.

CHAPTER FIVE

Government Institutions and Marketing Policies for Bhutanese Potatoes

Introduction

Government institutions and marketing policies can have a major influence on agricultural marketing in any country. This is especially true for Bhutan where development strategy traditionally has called for direct government intervention to promote socioeconomic progress. Beginning with programs initiated under the new policy of modernization and continuing on with main responsibilities given State institutions in subsequent Five-Year-Plans, the government of Bhutan has exercised a prominent role in stimulating, supporting and regulating agricultural marketing. A major concern in applying development strategy to Bhutanese potato marketing is how to meet the government's genuine socioeconomic responsibilities and to encourage local, individual initiative. Various government programs such as the Food Corporation of Bhutan (FCB) potato purchase scheme, guaranteed prices for high quality seed, and the establishment of regulated markets, have affected potato marketing, especially over the last decade. This chapter looks closely at these and other potato marketing activities of the FCB and the Department of Agriculture (DOA). It then examines the government's price, market controls, and export/import policies as they affect potatoes.

5.1 The Food Corporation of Bhutan and Potato Marketing

The two most prominent institutions affecting potato marketing in Bhutan are the FCB and DOA. As the government food marketing corporation, the FCB facilitates table potato exports. The DOA handles extension and input supplies such as seeds. It also organizes high quality seed potato exports. The FCB and DOA each have various responsibilities of which potato marketing forms only a part.

The Food Corporation of Bhutan was founded by the Royal Government in 1974, and has its headquarters in Phuntsholing. The FCB has been charged with four main responsibilities: (a) to buy and sell agricultural produce to insure fair prices for producers and consumers; (b) to accumulate and store supplies of essential commodities in the event of a food emergency, (c) to purchase and distribute foodgrains and other basic necessities as considered appropriate by respective government departments; and (d) to build and manage warehouses and/or storage facilities required to perform its official duties.

The FCB in practice essentially does two things.

First, it sells imported cereals, sugar, salt, and edible oils through a chain of 34 depots/retail outlets situated throughout the Kingdom. From 1977 to 1981, the FCB imported about

3,000 tons of cereal products a year. Most imports were rice, purchased at a subsidized price from the Indian government. During the same period, the FCB also bought and sold about 200 tons of locally produced grain, again mostly rice, through a support price/purchasing program for cereals. All FCB food sales are retail, in small quantities and for cash.

Second, the FCB manages a cash crop export program. This program includes the following crops: table potatoes, apples, oranges, cardamom and ginger. FCB responsibilities vary somewhat from crop to crop, but generally include an annual support price, a direct purchase scheme, the facilitation of technical assistance missions, and market research.

(i) Support Price and Direct Purchase Program

The FCB's potato program began in fiscal year 1974/75 with the announcement of a support price for table potatoes of *Nu.* 30 per *maund* (approximately 37½ kilograms). Since then corporation officals have fixed a support price for table potatoes every year at planting time (see Table 5.1), but also have introduced some modifications. For example, there are presently separate support prices for Grade I and Grade II table potatoes. Moreover, during each harvest, the FCB now reserves the right to revise the support price up or down, or leave the price in Phuntsholing the same and change the price at highland depots.

Annual changes in the support price are intended to reflect changes in production costs. Shifts in the support price during the potato harvest are made to account for shifts in prevailing supply and demand conditions. Adjustments in the provincial support price (vs. the border support price) are considered a necessary producer safeguard against beguiling traders. In this last instance, FCB announces new highland support prices as prices at the border go up, so that rural traders will be pressured to pay growers more money for their potatoes.

The support price program does not obligate potato growers to sell their potatoes to the FCB. In fact, over the past three seasons, growers have sold the FCB few potatoes. However, if they decide to do so, then certain procedures are generally followed. Farmers first bring their potatoes to one of the FCB depots themselves for inspection and grading. Once all potato sacks have been poured open and contents examined, the farmer is paid according to the prevailing support price for the quantity and quality of potatoes accepted by FCB personnel. In spite of farmer's complaints to accept all their harvest as is, generally some potatoes are returned to the growers. Purchased potatoes are packed in FCB-labeled bags for shipment. When the depot has accumulated a truckload of po-

Table 5.1 Bhutan: FCB potato support price, selected years.

Year	*Nu.* per maund*	*Nu.* per quintal†
1974/75	30	75
1975/76	30	75
1967/77	32	80
1977/78	33 Grade I	82.5
	30 Grade II	75
1978/79	35 Grade I	87.5
	32 Grade II	80
1979/80	32 Grade I	80
	(Support price reduced to *Nu.* 30 and *Nu.* 28 per maund during the harvest)	
1980/81	30 Grade I	75
1981/82	28 Grade I	70

Source: FCB, as cited in Rao, et al., 1982.
*One maund = roughly 37.5 kg.
†One quintal = 100 kg.

Table 5.2 Bhutan: FCB potato purchases and exports for selected years.

Year	Purchases (tons)	Exports (tons)	Value (*Nu.* 1,000)	Profit (Loss) (*Nu.* 1,000)
1975/76	1046	1046	1046	(50)
1976/77	2476	2476	1823	(357)
1977/78	1146	1146	1622	N.A.
1978/79	2617	1397	1507	(76)
1979/80	5000	N.A.	N.A.	(20,000)

Source: FCB, as cited in Rao, et al., 1982.

tatoes, a message goes to regional headquarters. A government truck then comes and transports the potatoes from the depot to the border for sale.

In the initial years of this program, the FCB sold these potatoes either to traders in the border towns of Phuntsholing, Galeyphug and S./Jongkhar or to commission agents in northern West Bengal and Assam.The FCB occasionally sold some few potatoes to traders in Calcutta. In 1979, the Bhutan government purchased 3,000 tons of potatoes from FCB, which were then donated to the government of Bangladesh. These potatoes were shipped through Calcutta, but unconfirmed reports are that at least part of the shipment was spoiled in transit and never reached Bangladesh.

During several harvests in the late 1970's, the FCB lost money on its potato purchases and exports (see Table 5.2). In most years, the reason for this was an excessively high support price in relation to the selling price in India. Other factors were unsecured sales to commission agents who subsequently never paid for potatoes and insufficient transport at harvest time (1976/77). Heavy losses in 1979 apparently resulted from an unusual combination of events. There was a bumper potato crop in all of India in 1979, including West Bengal. As a result potato prices collapsed (see Table 4.3). Moreover, technical maintenance problems with a number of cold stores in northern West Bengal meant that they had to release all their stock for sale just when Bhutanese potatoes were reaching the border.

Due to 1979 financial losses and based on recommendation of an Indian consulting team (see Rao et al. 1982), FCB officials organized an auction yard in Phuntsholing in August 1982. The auction yard absolves the FCB of any responsibility for the prevailing selling price, i.e. the auction's motto is "no risk, no guarantee." Nevertheless, the auction provides Bhutanese growers and traders with several useful services: weighing, tabulating invoices, and overnight storage. In its initial months of operation, FCB provided these services without charge as an incentive to prospective participants.

(ii) Marketing Resources: Physical Facilities, Manpower, and Capital[1]

The FCB has physical, human and financial resources at its disposal. FCB personnel manage a chain of godowns and a new storage facility as part of the potato purchasing program. Most godowns are situated in the highlands near centers of com-

[1]This section draws on FAO (1982).

mercial potato production (see Table 5.3). With the cool climate, many are constructed of local materials which is all that is necessary. At other locations, a modern concrete building, with wire mesh walls to allow for ventilation, has been constructed. In addition, a Government of Australia grant enabled the FCB to construct a new, 1,000-ton capacity cold store in Phuntsholing. This facility will also be used to store apples and oranges.

The FCB employs about 200 individuals under the authority of a Board of Directors and managing director (see Table 5.4). Potato program personnel are in the Food Grains Division under supervision of the deputy managing director for business and the assistant director for cash crops. While a recent report has recommended a new, separate cash crops division, this proposal is still being evaluated (Rao, et al. 1982).

More important than the number and organization of FCB employees *per se* is their previous experience and academic training. Due to the manpower shortage in Bhutan, many relatively high positions in the FCB are filled by individuals with only limited academic preparation and previous supervisory experience. FCB personnel at lower levels have even less formal preparation and relevant work experience. Perhaps, for this reason the corporation's day-to-day operations are characterized by a hierarchical chain of authority with considerable responsibility and final decision making concentrated at the top.

Table 5.3 Bhutan: Location, capacity, FCB potato godowns, 1980-81.

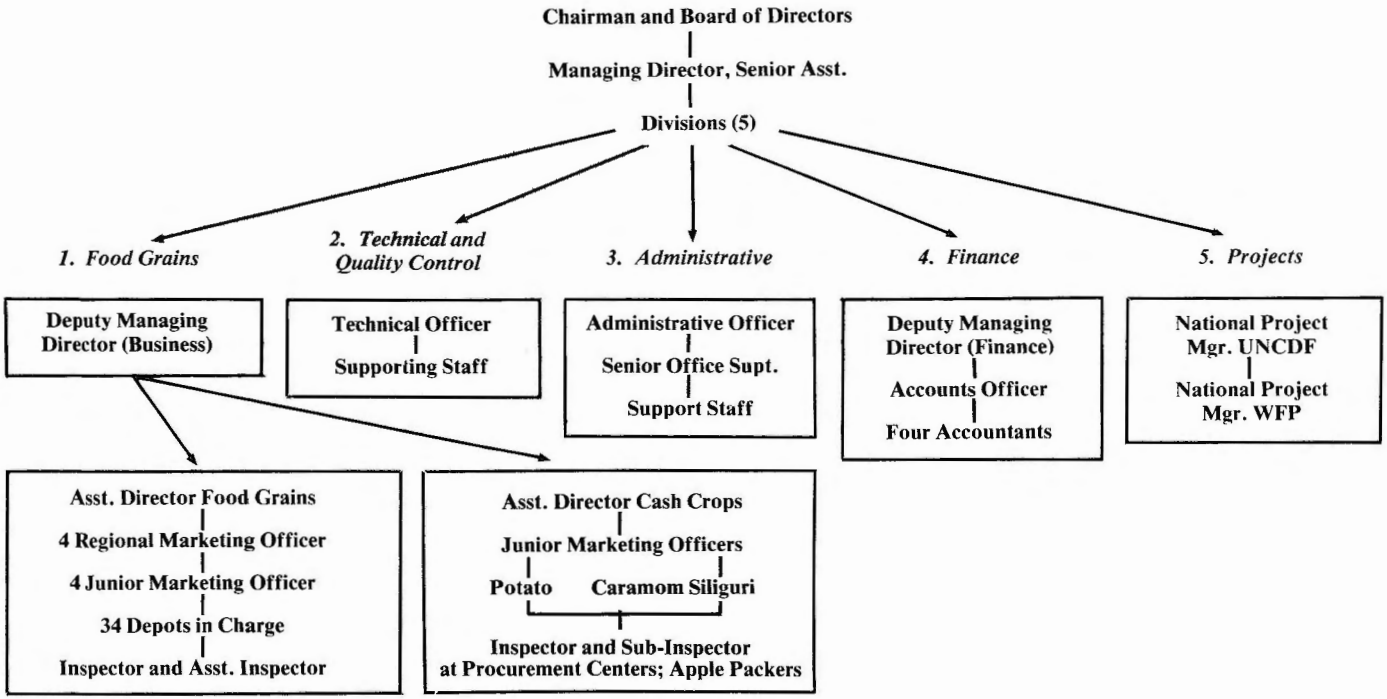
Region	Capacity (tons)
Western Hills	
Thimphu	50
Yoesepang	50
Paro	50
Nobding	50
Bitekha	50
Khadapchu	50
Eastern Hills	
Khaling	50
Southern Hills	
Phuntsholing	50
S./Jongkhar	100
Total	500

Source: Rao, et al., 1982.

Similarly, the record keeping system is not only basic but also burdensome. As such, it inhibits rapid processing of information except in response to specific requests. Moreover, steady reassignment of FCB personnel to different positions within the organization may enable all junior staff to acquire a wide range of practical experience. But, it also prevents any employee from gradually accumulating the specialized knowledge of his counterpart (competitor) in the private sector. In the specific case of potato marketing, the lack of academic training, previous work experience and specialized knowledge on the part of FCB personnel has been a definite handicap. Most importantly, only limited opportunities exist for potato program employees to review operating procedures and program records with senior staff or to conduct their own market surveys with the proper guidelines. No institutional on-the-job training is available.

Since its creation, the FCB has been highly dependent on grants from the Royal Government of Bhutan to finance operations. By the end of fiscal year 1980/81 the FCB had received a total of *Nu.* 5.2 million for construction of physical facilities. The

Table 5.4 Bhutan: Food Corporation (FCB) organization chart.



Source: Food Corporation of Bhutan, as cited in FAO, 1982 and Rao, et al., 1982

FCB also depends on a government grant to pay its annual operating expenses of *Nu.* 2 million. FCB trading operations, however, are financed by a bank overdraft limited to *Nu.* 30 million. Because of the *Nu.* 16 million in operating losses registered for the two fiscal years ending March 31, 1981, FCB faces a severe financial crisis. This situation is further aggravated by high annual rate of interest (12.5%) payable on the outstanding overdraft. Part of the solution to this problem has already been suggested: the FCB attempt to convert its annual overdraft arrangement to a long-term, low interest loan (FAO 1982). The other part includes a hard look at the financial aspects of the FCB's annual operating expenses and trading activities, particularly in terms of potato marketing. This set of issues is discussed both under section 5.3 below and in the conclusions and recommendations.

5.2 The Department of Agriculture and Potato Marketing

The Department of Agriculture was organized in 1961 and has its headquarters in Thimphu. The Department's responsibilities are divided into three headings: (1) Technical Services, (2) Policy Planning, and, (3) Management. Technical Services includes such things as extension, inputs, and horticulture. Policy Planning encompasses centrally planned and district projects as well as liaison with the different aid missions and international organizations. The Management heading is less specifically defined on the DOA's organizational chart.

DOA is the government institution responsible for exporting high quality seed. In organizational terms, the horticultural cell under Technical Services handles potato seed marketing in cooperation with the national potato program and the International Potato Center (CIP) representative. In practical terms, high quality seed exports are largely the responsibility of a veteran Indian employee of DOA. He is in charge of potato seed marketing and that of a number of different crops. He has no assistants and, in the case of potatoes, a meager operating budget.

DOA responsibilities for high quality seed marketing has consisted of setting a guaranteed purchase price for high quality seed grown by registered growers in Bhutan and negotiating an export contract with interested buyers in India. The guaranteed purchase price for high quality seed is based on estimated production costs. It is announced each year in March. Negotiations with Indian seed buyers has involved a meeting each year in June. After negotiations are concluded and an export price set, a formal contract is signed. Nevertheless, the terms of contract are quite flexible for the Bhutanese. If they are unable to deliver the seed, they simply return the money and the contract is cancelled. Still, the DOA sets the guaranteed price for high quality seed that it will buy before it knows the price for high quality seed that it will sell.

With the small quantities of potatoes involved and DOA's manpower problems, high quality seed export sales are conducted on an informal basis. No written reports are available on the estimated cost of producing Bhutanese seed or on the current selling price for comparable seed in India. Similarly, accounting practices for the program have been rather pragmatic. No records are maintained on expenses incurred for producing or for marketing seed. Still, the DOA

person in charge estimates that the program has shown a modest profit the last 2 years. While he contends that the program may have to absorb some losses in the future to develop the market, he is quite confident that high quality seed exports will be profitable in the long-run.

5.3 Marketing Policies that Affect Bhutanese Potatoes

A variety of government policies affect Bhutanese potato marketing. These policies strongly influence and in some cases literally determine the price of potatoes, where they are sold, by whom they are sold, and what other products compete with them in the market place. While these policies are highly interdependent, for the purpose of this report they are discussed separately below.

(i) Price Policies

Government price policy affects Bhutanese potato marketing, both directly and indirectly. The direct affect comes primarily from the support price for table potatoes and the guaranteed price for high quality seed exports. The official price for improved seed sold by DOA inside Bhutan has an additional, albeit less important, impact.

Support price for table potatoes, announced every year in February or March, is based on the current, estimated cost of production. Support price reflects the government's desire to encourage increased agricultural

Selecting and bagging seed potatoes in Khaling.
The tin is used as a unit of measure.

production and to protect Bhutanese farmers with limited resources from financial disaster. Support price also is used to prevent dishonest traders from taking advantage of illiterate and uninformed farmers.

The guaranteed price for high quality seed is another economic development initiative. To develop a new export market and to promote diversification of potato production to include high quality seed as well as table potatoes, DOA offers interested farmers a guaranteed price for their output. DOA personnel believe also that growers need an economic incentive to assume the additional costs associated with producing high quality seed according to the department's specifications. Interested potato farmers are obliged to sign informal contracts with DOA guaranteeing that they will sell their high quality seed to the department. Thus, in early 1981 and 1982, DOA announced the price it guaranteed to pay for high quality seed harvested at the end of the calendar year.

The DOA also sets the price every year for improved seed produced on government farms that it sells to local growers. This price includes production and transport costs. Past policy has been to sell these seed potatoes for the cost of production and to absorb freight charges in some instances. These moderate charges are justified on the grounds that they encourage use of improved seed by low-income farmers.

The indirect effect of government price policy concerns the official sale of imported rice. In the recent past, FCB practice has been to sell the rice itself at cost as well as to subsidize trucking costs from border to highlands. The government views this policy as part of its socioeconomic responsibility to provide basic necessities to all Bhutanese at a reasonable price.

(ii) Market Controls

A series of controls have been introduced recently to regulate potato marketing in Bhutan. These controls consist of licenses, taxes and permits. Auction yard administrators in Phuntsholing restrict entry to only licensed traders. One justification for this particular policy is to insure only legitimate merchants participate in the auction. Licensed traders must put up a deposit of *Nu.* 10,000. FCB policy also limits the number of licenses granted to Indian traders so to limit influence of Indian merchants on Bhutanese potato trade. Licensing procedures and public auction also are intended to make potato marketing a more public form of commerce. In the auction, Bhutanese farmers can hear the simultaneous bids of different buyers.

Several taxes also affect Bhutanese table potato marketing. In Phuntsholing, potato traders pay *Nu.* 2 per quintal as a bazaar tax and a 3% income tax on their reported gross sales. In Galeyphug, traders pay *Nu.* 2.5 per quintal as a bazaar tax and *Nu.* 5 per ton as an export tax. Tax revenues are intended, in part, to help border communities maintain local marketing facilities.

Table potatoes shipped through Phuntsholing now need a shipping permit to cross the border. This measure helps insure that all table potatoes exported through Phuntsholing are sold in the auction yard. It also facilitates the collection of potato export statistics. These statistics are needed to give policy makers and administrators a more accurate understanding of Bhutanese trade.

(iii) Export/Import Policy

The Royal Government of Bhutan through DOA, FCB, and various ministries also has a definite export/import policy. This policy encompasses classification and utilization of domestically produced farm commodities, the quantity, price and timing of official food imports, and the export/import guidelines governing Bhutanese trade. These measures affect potato marketing as well.

Agricultural policy in Bhutan has two thrusts: (a) to increase production of staples, and, (b) to promote exportation of cash crops. Until now, cereals were classified as staples and potatoes as a cash crop. These respective classifications determine the nature of numerous government initiatives. In the case of cereals, measures have been taken to insure adequate supplies and to import rice from India, if necessary. In the case of potatoes, the focus has been entirely on expanding potato exports either by promoting new products such as high quality seed or by improving existing export infrastructure such as constructing new cold storage facilities in Phuntsholing.

Past FCB food import practices raise additional questions about potato marketing. For example, from 1979 to 1981, the FCB not only imported 2,500 tons of rice for sale at cost in highland depots but also conducted peak rice sales at the time of the potato harvest, from August to October, in many communities, for example, Thimphu, Punakha, Bumthang (see Table 5.5). In 1979, in particular, FCB imported rice from India at the same time it threw away potatoes in Bhutan and for which it subsidized production. How such practices may have influenced local consumption patterns and hence the domestic market for potatoes is not clear. A more intriguing question is whether Bhutanese potatoes could substitute in part for Indian rice in times of scarcity.

Government ministries have export guidelines that serve to regulate all forms of foreign trade. Examples are transit papers and documents for shipments to third countries are issued by the Ministry of Trade; foreign exchange earnings in hard currency must be sold to the Ministry of Finance for Bhutanese Ngultrums The Ministry of Trade is negotiating a new treaty with India that governs transit rights for shipping to Bangladesh and Nepal. Thus, third country trading of potato shipments to places other than India is highly contingent upon government agreements. And, from the Bhutanese producers point of view, is largely in the hands of the public sector.

(Table 5.5, see page 64)

Table 5.5 Bhutan: FCB sales of quota rice—major depots (kg.).

Depot / Month	Thimphu	Wangdi	Punakha	Ha	Chucka	Chimathoki	Bumthang	Tongsa	Shemgang	Mongar	Lhuntsi	Tashigang	Phuntsholing	Gaylephug	Sharbang
March 1979	31,926											.....			
April	26,373											5,312			
May	29,266											4,138			
June	27,891											11,650			
July	42,847											6,139			
August	43,356											?			
September	27,013											?			
October	49,535											?			
November	43,657											4,330			
December	37,058											6,804			
January 1980	37,560											3,863			
February	41,565											4,976			
March	36,570											8,506			
April	25,450			5,571	7,350	6,825	11,772		5,604	4,163	5,247	2,256	5,065		5,835
May	38,104			5,073	10,900	7,922	9,938		8,884	11,436	6,318	22,216	9,248		6,065
June	46,269			8,037	13,010	10,386	12,432		5,694	13,764	8,208	36,247	14,348		5,628
July	49,957			7,261	15,051	8,125	9,123		4,569	11,345	8,198	25,229	11,643		6,766
August	57,497			8,906	20,090	9,130	12,275		5,882	6,563	9,490	7,768	9,437		9,331
September	49,831			9,242	14,508	9,959	20,611		5,812	6,402	9,888	8,474	6,151		8,580
October	53,869			7,315	20,095	9,697	20,080		4,826	5,577	9,492	5,043	4,933		6,487
November	30,764			8,850	10,395	4,597	13,426		3,992	4,574	9,116	5,231	6,542		9,419
December	23,801			9,528	12,030	7,556	12,383		2,867	4,386	5,188	3,630	2,155		1,945
January 1981	37,353		1,300	8,337	13,860	4,540	9,519	3,600	2,533	4,295	5,417	2,496	3,704	652	5,753
February	35,790		3,200	9,218	11,630	4,998	8,922	3,400	2,276	2,960	3,067	4,008	1,666	620	5,573
March	39,170		3,200	8,095	10,680	4,395	13,680	5,400	3,356	4,092	3,652	4,321	1,078	400	
April	25,450	852	1,700					5,200	2,689	5,340		5,463		319	
May	38,104	4,603	3,500					10,100	5,838	4,411		6,042		300	
June	46,269	4,926	3,000					2,400	5,281	5,437		6,692		797	
July	49,957	4,146	5,800					7,700	3,995	6,094		8,779		1,125	
August	57,479	1,783	4,400					2,900	5,026	9,088		8,109		1,719	
September	49,831	3,400	10,400					4,000	10,558	10,106		9,692		4,516	
October	53,869	2,987	5,000					2,000	8,532	5,080		5,683		631	
November	30,764	2,286	7,800					3,500	5,827	3,728		3,310		217	
December	23,801	3,778	700					3,800	3,106	4,252		1,273		2,133	
January 1982	.....	5,954	1,300					6,100	2,893	.....		.....		654	
February	.....		.....					3,200	.....	.....		.....		57	

Source: Food Corporation of Bhutan (FCB), as cited in FAO, 1982.

CHAPTER SIX

Future Prospects for Bhutanese Potato Marketing

Introduction

Bhutan's current Five-Year Plan calls for increased potato production and exports. There is an on-going debate in policy making circles about how much of different types of potatoes can be profitably sold. In fact, it is impossible to project the exact quantities of potatoes that Bhutan can profitably market because of limited statistics and numerous contributing factors. Increases in potato production in Uttar Pradesh, Bihar, West Bengal, and Assam constitute one major unknown beyond Bhutanese influence. Nevertheless, several critical variables are in Bhutanese hands. In general, Bhutanese potato program officials must secure a reliable foreign source of foundation seed for multiplication in Bhutan. Specifically, the Bhutanese can influence foreign potato marketing prospects by: (1) increasing productivity, improving quality and lowering unit production costs, and, by (2) aggressive efforts to secure existing markets and capture new ones. The Bhutanese can influence domestic potato sales by: (1) instituting programs to promote greater potato consumption and improved seed utilization, and, (2) re-evaluating the present food import practices of the FCB. This chapter considers future prospects for Bhutanese potato exports and then discusses the outlook for domestic potato marketing.

6.1 Future Prospects for Bhutanese Potato Exports

(i) Table Potatoes

Most Bhutanese potato exports will be table potatoes in the near future for several reasons. Table potato shipments dominate present trade patterns. Bhutanese farmers have limited capacity to alter radically their potato production practices in the short-run. Infrastructure, grading standards and seed multiplication programs necessary to promote high quality seed exports will take time to establish. Future potato research should help determine (a) the relative profitability of table vs. high quality seed production for export, and, (b) the quantity of high quality seed that can be sold on a contract basis.

The bulk of these table potato exports will go to northern West Bengal and Assam. Prices and quality considerations are major factors. Transportation costs to Calcutta, Delhi, or Bombay mean Bhutanese potatoes are much more expensive in those markets. For example, little difference existed in the wholesale vs. retail price for potatoes in Siliguri vs. Calcutta during August to October in 1981 (see Table 6.1). Rather, these data suggest that it would be hard to buy potatoes in Siliguri, ship them to Calcutta and sell them for a profit. Furthermore, consumers in adjacent West Bengal prefer a red-skinned potato. They like the taste of

Table 6.1 India: Retail potato prices in selected markets during 1981. (Indian *Rs* per kg.).

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
West Bengal												
Siliguri*	1.00	0.75	0.80	1.00	1.30	1.35	1.25	1.15	1.20	1.40	1.20	0.90
	1.10	0.80	1.10	1.20	. . .	. . .	1.60	1.20	1.40	1.60	. . .	1.30
Birpara	1.25	1.25	1.25	1.25	1.25	1.50	. . .	. . .	1.60	2.00	2.50	1.50
	. . .	. . .	. . .	. . .	1.50	. . .	. . .	. . .	. . .	. . .	. . .	2.50
Bataigola	1.20	1.25	1.25	1.40	1.50	1.50	1.50	1.75	1.75	1.80	1.75	1.25
	. . .	. . .	1.30	. . .	. . .	. . .	1.60	. . .	. . .	. . .	. . .	1.50
Sumuktala	1.00	1.00	1.25	1.00	1.00	1.40	1.60	1.60	1.50	1.50	1.50	1.40
	. . .	. . .	. . .	1.10	. . .	. . .	1.75	1.75	. . .	. . .	. . .	1.50
Hasimara	1.20	1.20	1.20	1.25	1.25	1.50	1.50	1.80	. . .	1.50	1.30	1.40
	. . .	. . .	1.25	1.30	1.60	1.60	. . .	. . .	. . .	. . .	. . .	. . .
Calcutta												
Belgharia	1.00	0.80	0.80	1.00	1.20	1.40	1.40	1.40	1.20	1.20	1.20	. . .
	1.20	1.00	0.90	1.20	1.60	1.50	1.70	. . .	. . .	. . .	. . .	. . .
Gora Bazar	0.80	0.90	1.00	1.00	1.10	1.30	1.20	1.25	1.30	1.40	1.30	1.50
	1.00	1.00	. . .	1.10	1.50	. . .	1.30	1.30	. . .	. . .	. . .	. . .
Jagatdal	1.00	1.00	0.80	1.00	1.20	1.30	1.20	1.20	1.30	1.30	1.40	1.50
	. .	. . .	1.00	1.20	2.00	1.40	1.40	1.40	1.40	. . .	. . .	. . .
Bara Bazar	0.90	0.90	1.00	1.00	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
	1.10	1.10	1.10	1.20	2.50	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Metia Cruz	1.20	0.80	1.00	1.00	1.20	1.40	1.40	1.40	1.40	1.40	1.40	1.50
	1.25	0.90	1.10	1.20	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tongsa	0.80	0.80	1.00	1.20	1.20	1.30	1.30	1.30	1.30	1.30	1.30	1.30
	1.00	1.00	. . .	. . .	. . .	. . .	1.40	. . .	. . .	. . .	. . .	. . .
Assam												
Rangpare	1.60	1.70	1.70	1.80	1.75	1.00	2.00	2.00	2.00	2.00	2.00	1.80
	. . .	. . .	. . .	. . .	. . .	1.75	. . .	. . .	. . .	. . .	. . .	. . .
Tejpur	1.70	1.60	1.60	1.60	2.00	2.00	2.10	2.20	2.20	2.20	2.00	2.00
	2.00	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

Source: Market Committee, Siliguri, Labour Bureau, (Regional Office), Calcutta as cited in Rao, et a., 1982.
*Wholesalé prices.
Note: The figures given indicate the constant or the minimum and maximum price during the concerned month.

Bhutanese potatoes and they receive their potatoes fresh from the field at a time when mostly only stored potatoes are available locally. Thus, Bhutanese potatoes can compete—even at slightly higher prices—with Indian potatoes sold in West Bengal and Assam. Consumers in Calcutta, however, prefer a white-skinned potato, they do not associate Bhutanese potatoes with any distinctly desirable taste, and the distance from Bhutan means that the potato would lose considerable freshness in transit. Similar quality considerations affect the viability of Bhutanese potato sales in Delhi.

Some Bhutanese potatoes occasionally are sent to Calcutta for use by potato chip manufactures. Ac-

cording to traders in Calcutta's wholesale markets, stored potatoes do not serve well for making potato chips. Bhutanese potatoes, then, have a competitive advantage in Calcutta at times when the regional supply of fresh potatoes for potato chips is insufficient to meet local factory needs. This particular market, however, calls for a different size and shape potato. Potatoes for chips are generally quite large and round rather than the quite small, oval shaped table potato. The little additional information available suggests that Bhutanese potatoes are only purchased in small quantities and under unusual circumstances for this purpose. Direct contacts with potato chip manufactures in Calcutta, however, might result in a new market outlet.

Assuming that Bhutan exported 5,000 tons of table potatoes in 1982, then this quantity seems a reasonable target for the years ahead. In other words, this report envisions that as potato production gradually increases, Bhutan will become less dependent on table potato exports. Instead of rapid growth in seed exports, more aggressive Bhutanese commercial farmers will slowly switch part of their ware production for export into improved common and/or high quality seed production. In addition, some subsistence Bhutanese growers probably will begin to produce surpluses for sale in local urban areas.

(ii) Common Seed

As long as Bhutan produces and exports potatoes, some will be sold in India as common seed. Again, principal export markets for common seed will be northern West Bengal and Assam. Key factors involved here are: (1) the decline in Darjeeling potato production; (2) production trends in West Bengal and Assam, and, (3) increases in productivity and quality in the hilly areas of eastern India, such as Shillong. In contrast to the rest of West Bengal, Darjeeling potato production has declined in the late 1970's. Yield increases were insufficient to affect the reduced area planted (see Tables 6.2., 6.3., and 4.4). If this situation persists, then other regional sources of common seed, particularly red-skinned seed from Bhutan, should experience continued strong demand.

Consumer demand for potatoes in West Bengal has been strong, especially the past 5 or 6 years. The associated, steady increase in producer potato prices has served to induce a rapid growth in potato production. Since the area's population continues to increase and potato consumption remains a complement to rice (hence it hardly has achieved saturation levels), the outlook for increased production seems bright. All these developments suggest an accelerated demand for common potato seed. However, the experience in 1979 indicates price and production trends need to be studied on a continuous basis. Bumper Indian crops mean potatoes are cheap locally and there is little incentive to import even from Bhutan. Less spectacular Indian output translates into a steady demand for inexpensive seed on the part of semi-subsistence potato producers, especially in northern West Bengal and Assam.

The report therefore, estimates that Bhutan will be able to ship about 1,000 tons of common seed into India by the end of the current Five-Year-Plan. A final determinant of marketing prospects for these potatoes will be selection (by variety) and grading (by size). Present standards must be improved to compete in the years ahead with Indian seed growing areas like Shillong.

Table 6.2 West Bengal: Area under potato in different districts, 1960/61 to 1978/79, (000 hectares).

Year	Burdwan	Birbhum	Midna-pore	Howrah	Hooghly	24 Parga-nas	Nadia	Murshi-dabad	West Di-najpur	Malda	Jalpai-guri	Darjee-ling	Cooch-behar	Purulia	Bankura
1960-61	11.3	5.5	5.6	0.9	16.5	2.1	0.3	3.3	3.9	0.9	2.2	2.5	1.5	0.1	2.0
1961-62	9.6	4.8	6.5	1.1	17.4	2.0	0.2	2.7	3.5	0.8	2.3	2.5	1.7	#	2.4
1962-63	12.5	4.4	7.5	1.6	20.3	2.2	0.4	3.9	3.5	0.7	2.5	2.7	1.9	0.1	1.9
1963-64	13.0	5.0	8.2	1.6	19.5	2.9	0.5	2.5	3.1	0.6	1.8	3.0	1.3	0.1	2.5
1964-65	13.7	5.1	8.7	2.0	21.8	2.9	0.5	3.2	3.5	0.7	1.7	4.1	0.7	0.3	2.1
1965-66	16.2	6.8	10.5	2.1	24.6	3.9	0.6	4.0	3.0	0.6	1.6	4.3	1.5	0.2	2.2
1966-67	14.0	5.7	10.5	1.8	22.1	3.2	0.6	4.6	3.2	0.9	1.6	3.4	1.5	0.3	2.4
1967-68	15.0	6.7	11.6	2.3	21.1	3.5	0.4	3.6	4.0	1.2	1.6	3.1	1.4	0.3	2.7
1968-69	11.7	6.3	10.5	1.4	20.0	3.0	0.4	3.7	4.5	1.0	1.1	2.4	1.7	0.4	2.8
1969-70	9.1	4.7	8.8	2.5	14.9	2.8	0.3	2.8	3.8	0.7	1.3	2.6	1.5	0.4	3.4
1970-71	14.6	5.0	10.0	1.9	16.0	2.3	0.2	2.7	3.2	0.7	1.2	2.5	1.7	0.3	2.8
1971-72	14.0	5.4	10.9	2.2	20.2	3.0	0.4	3.9	3.0	0.7	1.2	2.4	1.3	0.5	3.7
1972-73	14.6	4.8	12.6	2.2	19.5	3.7	0.8	4.0	4.5	0.8	1.0	2.3	1.6	0.4	2.9
1973-74	14.9	4.8	11.5	2.3	23.1	3.3	0.9	4.5	5.0	1.0	1.3	3.1	1.6	0.3	2.9
1974-75	20.3	6.7	10.1	2.2	23.0	3.5	1.3	4.8	4.0	0.9	1.2	3.0	1.2	0.3	3.5
1975-76	22.3	7.6	15.0	3.0	22.8	5.2	2.7	5.8	8.2	1.9	3.8	3.9	4.2	1.5	4.9
1976-77	22.0	7.4	13.9	3.2	25.4	5.8	2.8	6.4	8.4	2.3	3.9	2.0	4.8	1.1	4.3
1977-78	22.9	7.6	16.0	3.8	29.8	5.4	3.3	6.2	8.6	2.4	4.3	2.1	4.8	1.4	5.6
1978-79	31.0	8.6	20.8	5.6	37.7	7.7	4.3	8.3	10.3	2.5	5.4	1.9	5.5	1.7	8.3

Source: Chowdhury and Sen, 1981.
#Less than 50 hectares.

Table 6.3 West Bengal: Average potato yields in different districts, 1960/61 to 1978/79, (kg. per ha.)

Year	Burdwan	Birbhum	Bankura	Midna-pore	Howrah	Hooghly	24 Par-ganas	Nadia	Murshi-dabad	W.Dinaj-pur	Malda	Jalpai guri	Darjee-ling	Cooch-behar	Purulia
1960-61	12779	9291	7850	7714	10778	13200	6571	5667	7605	4307	6222	4636	6720	4867	4000
1961-62	14355	16188	6833	10154	8636	18644	6500	6000	6926	5800	7750	5913	6720	5765	.....
1962-63	15848	7159	7000	9907	10563	17458	7364	5500	6615	5000	6857	6680	5852	5579	4000
1963-64	9770	7600	5640	10293	7500	9262	4655	3400	7160	4419	4667	4000	6300	2846	4000
1964-65	14270	10039	8952	10115	11750	13445	7448	9400	11844	4429	8714	7235	5024	7429	8333
1965-66	11855	9833	10909	10276	10619	12667	9769	10500	9900	5633	6333	5938	4209	5933	7500
1966-67	10464	7825	9150	8638	9333	9167	7875	7500	7826	4969	4889	4813	4706	4867	6333
1967-68	10247	7119	8593	8190	8696	4171	8686	8750	9611	3575	3583	3563	4645	3786	8333
1968-69	15547	9873	13000	10943	13571	14865	12200	11250	13162	5044	5000	5000	4750	4882	13250
1969-70	12582	8213	11412	10318	11320	13000	9699	10333	9679	4026	3714	4077	4462	4067	11750
1970-71	17541	11160	15679	13400	15316	17662	14087	16500	14148	5406	5857	5833	4680	5471	16333
1971-72	14750	16222	16216	12752	16227	20208	11533	11500	11256	3333	3286	3333	4542	3385	16200
1972-73	15110	10188	13724	9897	13727	16646	12487	12500	12275	4890	4875	4900	4609	4875	13750
1973-74	13020	9938	13690	10374	13391	16589	9879	10222	11600	4800	3400	3308	5097	3500	11667
1974-75	20138	10856	15257	11020	9000	21103	9314	14923	18854	5050	5667	7083	4700	6333	17333
1975-76	18897	10132	13837	14507	17233	19667	12000	15333	14914	5659	5895	5911	5615	5929	9600
1976-77	19273	11878	14767	16619	18563	17359	12397	16071	14828	5095	8435	5128	6050	5563	8727
1977-78	19520	11961	16143	16044	17553	19027	13111	16051	13339	7023	10000	6558	6952	7167	10071
1978-79	18532	10477	16602	14653	16304	19432	12416	16302	13012	8427	8080	7278	7632	9236	10059

Source: Chowdhury and Sen, 1981.

(iii) High Quality Seed

Bhutan also will export high quality seed potatoes in the future. Most of this seed will go to northern West Bengal and Assam where the Bhutanese have established a small, but growing market. Bhutanese high quality seed exports will be influenced partly by the regional demand and marketing considerations referred to previously. In addition, high quality seed exports will be affected by: (a) relative prices for high quality export seed vs. common seed, and, (b) shifts in distribution of total area of potatoes planted among subsistence and commercial growers.

Relative prices for high quality vs. common seed potatoes will affect Bhutanese exports as follows. If the price of Bhutan's high quality seed goes higher and higher in relation to common seed, then it will become more and more difficult to market. Greater and greater productivity differentials between the two types of seed would have to exist to economically justify purchasing one rather than the other. From the Bhutanese perspective, relative seed prices and productivity will depend, in turn, on: (a) final quality standards set by Bhutan's national potato program and the resulting costs of production per kilogram, and, (b) yields per hectare received on Indian farms using Bhutanese potatoes.

Casual empiricism suggests that most potato producers in northern West Bengal and Assam are small-scale, semi-subsistence growers. One in 20, perhaps, are relatively large-scale, commercial growers. Semi-subsistence growers prefer a tiny seed potato because it gives them better coverage. They generally are reluctant to invest large amounts of money in high quality seed because of the agronomic and economic risks associated with potato production. In contrast, large-scale commercial growers appreciate the advantages of using larger, high quality seed tubers and they have the capital to risk on profit-generating, improved inputs. The recent trend in West Bengal has been for potato production to spread to more inefficient farms (Chowdhury and Sen 1981). Thus, no economic pressure has forced growers to reduce unit-costs by utilizing high quality seed. They could use practically any kind of seed and make money. If such trends continue, then the demand for high quality seed will be restricted to a relatively small group of commercial growers. The report concludes, nevertheless, that exports of high quality seed could quadruple to 1,000 tons during the next 5 years. This estimate is based on conversations with national potato program personnel in Bhutan, West Bengal Agro-Industrial Corporation staff, and traders in adjacent Indian states. These figures are highly dependent on the final seed standards and selling price established by Bhutan's national potato program.

(iv) Third Country Potato Exports

Discussions of Bhutanese potato marketing frequently include reference to the potential for third country exports, to Bangladesh, Nepal, Sri Lanka, Burma. Such exports are attractive because they would enable Bhutan to break its heavy dependence on Indian markets plus they offer the possibility of earning hard currency. However, exports of table potatoes or high quality seed to third countries seem doubtful in the near future. Bhutan is still negotiating a new trade agreement with India that would allow rail or river shipments direct to northern Bangladesh via Assam. In

the interim, shipments of Bhutanese potatoes to Bangladesh via Calcutta are uneconomical given the transport costs. In any event, Bangladesh has limited foreign exchange to import any kind of potatoes (see Table 6.4). Recent seed imports from Holland—about 2,000 tons in 1981—were financed entirely by Dutch commodity aid.

Bhutanese potato exports to Sri Lanka or Burma seem even more improbable. Sri Lanka is prohibiting potato seed imports.[1] Little is known in Bhutan about potato production in Burma: varieties planted, planting dates, or cost of locally procured seed. Both countries are also far away in terms of transport costs.

The Nepalese case is somewhat more complicated. While some Bhutanese common seed apparently enters Nepal via Siliguri every year and a potential may exist to expand these quantities to more significant amounts, this expansion would have to be handled entirely by the private sector. Bhutan has no official trade agreement with Nepal that would facilitate official shipments of high quality seed from the DOA to its sister institution in Nepal.

Table 6.4 Bangladesh: Potato seed imports, selected years.

Year	Quantity (tons)
1973/74.....	2702
1974/75.....	3580
1975/76.....	3672
1976/77.....	1284
1977/78.....	1436
1978/79.....	1216
1979/80.....	N.A.
1980/81.....	N.A.
1981/82.....	1640
1982/83.....	2700

Source: 1973/74—1978/79, 1980.
1981/82, Maziruddin, 1982.
1982/83, Personal communication with Mr. Luitjens.

(v) New Potato Export Products

Some consideration has also been given prospects for marketing new potato export products. For example, given the altitude and soil conditions, Bhutan is a promising site for foundation seed production. By contract for a given variety, small quantities (100 tons) of such seed may be marketable in Bangladesh, even shipping through Calcutta. But, Bhutanese potato program leaders should also consider the economics of exporting small quantities of foundation seed that Bangladesh producers would multiply for re-sale in large quantities. Economic development normally necessitates increasing the local value added to raise (farmers') incomes. In other words, as much multiplication of imported seed as is profitably possible should be done in Bhutan. Unless shipping costs for large quantities of common or high quality seed are prohibitively expensive, as is suggested above, or profit margins per ton for foundation seed unusually large, then all Bhutanese seed exports should be no higher in quality than certified seed. Otherwise, foundation seed exports now reduce the market for certified and common seed in the future.

Potato starch is another potential export product. An experimental processing plant is now being tested in Paro and another will be constructed at Phubjikha. At the same time overtures have been made to prospective buyers in Phuntsholing and Calcutta. Particular interest has been shown in a form of starch used by bakeries, for which potatoes apparently have a cost advantage over corn or rice. Such a processing plant may be able to absorb surplus pota-

[1]This observation is based on conversations with Jim Bryan, CIP seed specialist.

toes that are harvested during a seasonal glut in supply. Present plans to study the cost of producing and marketing starch are a wise decision. Efforts to insure quality control at the more remote village level also merit attention.

6.2 Future Prospects for Domestic Potato Marketing

The domestic market offers additional possibilities for Bhutanese potatoes. Even at present, all potatoes that are exported—table potatoes, common seed, and high quality seed—are also sold inside the Kingdom. Development plans, then, should consider expanding domestic potato sales in light of three factors: (1) the domestic market is the most secure in terms of rival potato producers; (2) more Bhutanese eat more potatoes than previously realized; and (3) domestic sales of high quality seed in particular can bolster potato exports by improving productivity on Bhutanese farms.

(i) Table Potatoes

Several considerations point to an increased potential for domestic table potato marketing. On the one hand, demand for table potatoes will depend largely on the growth of urban areas. These towns represent a small percent of the national population, and therefore, presently consume a minor share of domestically harvested

Potato experiments in greenhouse at Yoesepang government farm.

potatoes. On the other hand, since these areas are the principal source of food deficits in the country, greater urbanization and increased incomes alone offer some prospect for increased table potato consumption.

Furthermore, growth in urban demand for table potatoes could be fostered by one or more official initiatives not entirely inconsistent with the stated development goals of increased self-sufficiency and improved farmer incomes. For example, government officials could urge managers of local construction projects to buy potatoes locally rather than to import food for their workers.

Or, Bhutanese policy makers may want to promote potato consumption on nutritional grounds (see Poats 1982). They also may recognize the present cereal shortage and potato surplus. While cereal productivity is being improved and a high quality seed program being established, imported rice sales could be curtailed—especially at the time of the local potato harvest—and urge government employees, schools, and monasteries to consume more potatoes as part of a nation-building effort. Moreover, the Bhutanese are a traditional people with tremendous respect for their leaders. If Bhutanese officials were to consume more potatoes themselves, this example may be the most effective policy of all for promoting greater potato consumption and, in effect, increasing food self-sufficiency.

In any event, various different policy measures and government initiatives are available from which Bhutanese officials may chose. Any one, or several in combination, could expand the domestic market for table potatoes.

(ii) Common Seed

Some farmers and retailers inside Bhutan also sell common seed potatoes. In normal years, farmers plant mostly their own seed saved from the previous harvest. In addition, however, growers will buy or barter for seed from other potato areas inside Bhutan to supplement their own supply. And, if potato prices are particularly good, they will sell everything at harvest and purchase whatever seed they can find at planting time.

Conflicting developments will affect common seed potato marketing inside Bhutan in the years ahead. This report anticipates that the growing number of weekly fairs throughout the Kingdom will stimulate common seed potato marketing. More potato farmers will know who has potatoes to sell and at what price. Still, as the national potato program's seed multiplication scheme develops, more improved and/or high quality seed should become available around the country. In other words, potato producers will be less dependent on whatever seed they can purchase from local merchants or fellow farmers. Spread of potato production among small, semi-subsistence farmers and the relative price of improved vs. common seed largely will determine which of the developments described above will have more influence on common seed potato marketing in the near future. However, it is imperative that more high quality seed be utilized in Bhutan to upgrade local common seed.

(iii) High Quality Seed

The principal beneficiaries of the high quality seed program in Bhutan should be Bhutanese potato farmers themselves. As the program matures, more growers should become aware of the advantages of using such seed.

Consequently, larger quantities must be set aside to meet their needs before any high quality seed potatoes are exported. The report envisions, then, that three types of high quality seed will be marketed in Bhutan: (1) seed to produce table potatoes; (2) seed to produce common seed, and, (3) seed to produce more high quality seed. The combined markets could amount to some 500 tons of potatoes annually.

This estimate of domestic high quality seed sales may appear to be too conservative. The rationale is as follows: 500 tons represent about what is demanded in the way of improved seed all over the country at present. The new project, then, needs to grow 1,500 tons of seed (1,000 for export), about 10 times present production, and to organize an efficient internal distribution system for part of this output. This effort will involve not only finalizing certification standards on government farms, but also tightening contractural arrangements with registered growers, improving coordination with district officers about varieties and quantities desired, establishing accounting procedures and appropriate price policies.

6.3 Constraints to Bhutanese Potato Marketing

Bhutanese potato marketing faces different types of constraints: one is general, others are more specific. In general, the Bhutanese potato development program is highly dependent on imported improved seed for multiplication and distribution in Bhutan. A major effort will be needed to secure adequate supplies of such seed in the future to avoid total reliance on India. The more specific constraints concern potato exports and domestic potato marketing.

(i) Constraints to Bhutanese Potato Exports

Production constraints refer to those factors mentioned in Chapter Three that affect increases in productivity, declines in unit production costs, and improvements in quality. Production constraints will influence Bhutanese potato exports simply because the most efficient marketing arrangements imaginable cannot substitute for high quality, low priced potatoes.

A successful export program depends not only on a good product but also on effective marketing practices. Major marketing constraints to Bhutanese potato exports fall under five categories: (1) procedures, (2) personnel, (3) information and communication, (4) policy, and (5) financing. The procedural constraints concern first, selection and grading. Bhutanese export markets are highly competitive and highly differentiated. Indian potatoes tend to be carefully graded by size. Different varieties are rarely mixed in the same bag. In contrast, many Bhutanese growers apparently lack the time, labor or training to select potatoes by varieties and then to grade them by size, depending on whether they are to sold as seed or table stock. Border traders generally would prefer a better graded Bhutanese potato. If they have to grade potatoes themselves, then they must offer a lower price to absorb this additional cost. Some Indian merchants simply prefer Indian potatoes because of their uniformity. Hence, poor grading is a constraint to Bhutanese exports. (It does not affect domestic sales because consumers prefer to select their own potatoes at the time of purchase).

Another procedural constraint is created because Bhutanese are accustomed to market their potato exports in Bhutan. Bhutanese generally are quite shy around foreigners. They feel more confident dealing with them in Bhutan than outside the country. Partly for these reasons, partly because of language difficulties, Bhutanese are accustomed to export their potatoes at the border. Foreign buyers, in effect, come to the Bhutanese to purchase potatoes. This procedure puts Bhutanese at a distinct disadvantage in terms of current market information, for instance whether their table potatoes are sold as seed or table potatoes, and at what price. It also means Bhutanese have limited access to continuous market information. That is how prices, grades, varieties may be evolving from season to season. This constraint limits Bhutanese bargaining power, their ability to adjust to changing market conditions, and their "on-the-job" training as potato traders.

Personnel constraints also handicap Bhutanese export potato marketing. FCB does have a small group of employees assigned to work on potatoes, but their experience and training is extremely limited. DOA has only one individual in charge of seed potato marketing along with half a dozen other programs. A long-term official commitment to promote potato exports necessitates a comparable commitment in terms of manpower. An effective export program needs a group of cadres to conduct marketing research, to seek out and to negotiate marketing contracts, to ad-

Bagging potato seed for export at Yoesepang government farm.

minister the auction yard and to disseminate information at home and abroad. The present program is constrained by absence of such key personnel.

A shortage of several different types of information constrain Bhutanese export potato marketing. First, some confusion exists about whether (a) red or white-skinned varieties are more profitable to export as table potatoes and (b) how much more money a grower can make by producing high quality seed instead of table potatoes in an average year. Second, support price and guaranteed price levels need to be based on information about production and marketing costs in Bhutan and India that presently are not systematically collected and analyzed. Third, highlands growers now rely entirely on informal information channels to acquire knowledge about prevailing market conditions in border areas or Indian cities and truck movements between major towns inside Bhutan.

Communication between Phuntsholing and remote highland potato depots is also a constraint. For example, poor communication can mean that potatoes accumulate too fast or too slow. As a result, potatoes may deteriorate in quality or they may be sold at a much lower price than might otherwise have been true.

Certain government policies also constrain Bhutanese potato exports. Market controls such as shipping permits, border taxes, and market taxes are a disincentive to traders or farmers who export Bhutanese potatoes. These controls tend to drive up cost of exporting and, therefore, the price of Bhutanese potatoes in export markets. They also run counter to the thrust of other official measures, such as support prices to encourage production for export or the subsidy on fuel to lower internal freight charges.

Present licensing procedures for the Phuntsholing auction yard restrict potential new buyers from participating in the market. The emphasis has been on excluding additional and/or illegitimate Indian traders rather than on providing credit to finance new Bhutanese participants. While latent official suspicion of the private sector is gradually giving way to greater pragmatism, recent government measures to control exports have tended to constrain foreign potato sales.

Most importantly, the shortage of financing constrains the exports of potatoes. The Bhutanese lack capital to hire more staff, collect more information, or improve existing communication facilities. As a result, there is a complete and, to a certain extent, counter productive reliance on external financial assistance to support the entire potato export program. Such total dependence on foreign aid appears at least partly responsible for the generous support price policy which tends to discourage productivity increases and for the ineffective enforcement of seed potato contracts. A partly self-financed program might be less ambitious, more cost conscious, and eager to explore new avenues for generating revenues internally. Such a program might even attract greater resources from abroad.

This report does not consider existing public cold storage capacity to be a constraint for potato exports. In this regard, it disagrees with earlier studies (see Rao, et al. 1982). Most Bhutanese potatoes are sold at harvest because prices generally are most favorable at that time. Storing potatoes harvested in August or September for export in December or January would not be profitable because these old

potatoes would compete with the new, cheap Indian crop. However, storing potatoes for export as seed might be viable. This type of storage is already done on farms in the highlands of the Eastern Hills region.

Transportation arrangements are adequate in most areas.The trucking syndicate that dominated freight shipments inside the Kingdom until recently has been abolished by royal decree. The present system for hiring a truck is simplier and cheaper. Some communities, Ura, for example, still have problems securing transport for their potatoes. In these isolated production areas, transportation is a constraint for potato export marketing.

(ii) Constraints to Domestic Potato Trade

Major constraint to domestic marketing of Bhutanese potatoes concern (a) consumer/producer education, (b) government export/import policy, and, (c) subsidies and selling practices of FCB for imported rice. Research by Poats (1982) indicated that many Bhutanese are unaware of how to prepare potatoes or of their nutritional value. The limited consumer education about potatoes no doubt discourages greater purchases and hampers marketing prospects. Furthermore, producers appear to be unaware of the advantages of using improved seed in terms of yields and returns per kilogram. For example, Bhutanese growers believe that a higher selling price per quintal for a certain variety automatically means higher profits per hectare. This type of misconception constrains improved seed sales inside Bhutan.

The government's export/import policy also constrains domestic potato marketing. Inaccurrate appraisals of domestic potato consumption have preempted official interest in greater domestic potato utilization. The somewhat arbitrary classification of potatoes as exclusively a cash crop for export has also served to discourage domestic potato marketing. Analogously, local food needs are equated with cereal production plus cereal imports. The readiness to meet domestic food needs with foreign produced rice sold by government food depots overlooks the possible impact on domestic potato demand. Furthermore, the present FCB practice is to sell great quantities of imported rice at or near the purchase price at the time of the potato harvest. The timing of these sales and the selling price of the rice in question, combined with the lack of programs to promote potato consumption helps to perpetuate the second class status of potatoes in the minds of most Bhutanese consumers.

This report does not consider large-scale storage of Bhutanese table potatoes for eventual sale during January, February and March to be a viable way of increasing domestic potato sales. Small-scale storage already takes place, but these potatoes cannot compete with cheap, fresh Indian potatoes. Moreover, the World Food Program only has limited authority to procure food supplies locally. Hence, domestic potato marketing cannot be argumented in such fashion.

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