Chapter - 18

COMMODITY CASE STUDY: VEGETABLE SEEDS

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Vegetable seeds are viewed in Nepal as a commodity with substantial export potential. This view is gaining popularity for two main reasons. First, the country's agro-ecological diversity together with the mountainous terrain provides opportunity for isolation within a short distance, which helps in hybridization of a wide variety of crops. Second is the country's proximity to the large South Asian markets, notably India. Seeds are also considered to be an appropriate export commodity for Nepal in view of the high value, low volume nature of the product. The WTO Membership is considered to be a plus in exploiting this potential. However, Nepal is required under the TRIPS Agreement to enact laws that provide intellectual property protection to plant breeders, thus encouraging private sector R&D and foreign investment in the seeds sector. The government has also recognized this potential and included vegetable seed production as a "national priority industry" under the Industrial Enterprise Act 1992.

The reality, however, is different. Although Nepal has gained some experience in the export of seeds, it has been virtually limited to one market (Bangladesh) and one product (radish – Mino Early variety). The paradox is that the country is increasingly dependent on imported seeds. Hence, the immediate challenge is to become import-competitive, i.e. growing enough quantity of good quality seeds at prices competitive to imported seeds. In practice, efforts are required in both fronts – import-substitution and export promotion. There is a general consensus among the Nepalese experts and stakeholders in the seeds sector that with right policies and incentives, seeds stand a good chance of being an export commodity while substituting imports as well.

In view of this, the purpose of this chapter is to assess the competitiveness of vegetable seeds[126] in both export and import front, and to discuss related constraints and policy issues. The chapter, organized in three sections, starts with an overview of the vegetable seeds sector covering marketing and trade issues. This is followed by identification of the key issues and challenges facing the sector and a section on conclusions and suggestions.

The study is based on published and unpublished secondary information, and interview with seed entrepreneurs including seed growers. The sources of secondary information include: Seed Quality Control Center (SQCC) of the MoAC, National Seed Board (NSB), Central Seed Testing Laboratory (CSTL), Vegetable Development Directorate (VDD) of the DOA, Seed Entrpreneurs' Association of Nepal (SEAN), SEAN Seed Service Centre (SSSC), the Fresh Vegetable and Vegetable Seed Production Project, Trade Promotion Centre, quarantine offices (Nepalese and Indian), bank officials and a few NGOs, apart from literature review.

[126] Unless stated otherwise, "seeds" in this chapter refer to "vegetable seeds" .

OVERVIEW OF THE VEGETABLE SEEDS SECTOR

Production trends in the formal and informal sectors

Until the mid-1980s, more than 90% of Nepal's vegetable seeds requirement was met by informal sources, i.e. own production and farmer-to-farmer exchange. But within the last twenty-five years the commercial seeds sector has grown rapidly. From a mere 10 tonnes of commercial seeds produced in 1975/76 (9 tonnes from government farms and one tonne from private growers), it reached 700 tonnes in 2002. Now the formal sector supplies 70% of the total demand, which was only 10% in 1984/85. About 50 cultivars of vegetable seeds are produced and marketed in Nepal. However, nearly 70% of the total domestic use in volume term is accounted for by radish, bean, pea and okra.

External assistance during the past 25 years has been instrumental in the development of the seeds sector. A Swiss-funded project with FAO technical assistance, *Fresh Vegetable and Vegetables Seed Production Project*, launched in 1981 in association with the then Vegetable Development Division of the DoA, is credited to have made substantive contributions. During its 15 years' period (1981-1996), the project introduced a systematic vegetable seeds production programme with major thrust on introduction, improvement, recommendation and release of commercial varieties. Other projects also made important contributions in developing physical infrastructures and human resources. Although these activities spread throughout the country, the success rate was uneven. As a result, while seed production activities virtually disappeared in some areas, marked successes has been achieved in others and have continued even without external support.

Of the nearly 700 tonnes of commercially produced seeds in 2001/02, a substantial proportion (about 40%) came from three regions: Koshi hills, western hills and mid and far western hills and mountains (Table 1). The main seeds produced are radish, bean, cress, pea and cauliflowers. Rapti area is particularly noted for the production of radish seed (Mino Early), which is also virtually the sole seed exported from Nepal. Other noteworthy crops for seed production with export potentials are carrot (New Kuroda) in Jumla and onion (Red Creole) in Rapti area.

Table 1: **Major production areas and volumes of seed produced**
(In M. Ton)

Area	1997/98	1998/99	2000/01	2001/02	Major crops
Koshi hills	18	44	72	55	Radish, beans, peas
Western hills	13	40	58	69	Radish, beans, peas, cress
Far –western hills	n. a.	4	6	24	Radish, beans, rayo
Rapti hills	n. a	n. a	n. a	100	Radish, onion, rayo, beans, cauliflower
Jumla/Dailekh	n. a	n. a	n. a	20	Carrot, rayo, onion, coriander

Source: Hada and Chitrakar (2002).

According to the VDD estimates, the national seed requirement was 1 360 tonnes in 2001/02, of which slightly over 50% was supplied by the domestic formal sector (Table 2). This sector has steadily increased its share in total commercial supply in recent years. Imported seeds also continue to play a prominent role.

Table 2: **Improved vegetable seed requirement and supply: 1997/98 - 2001/02**

	1997/98	1998/99	1999/00	2000/01	2001/02
Improved seeds requirements (M. Ton)	1275	1283	1317	1334	1360
Supplied by imports and domestic informal sector					
--- in quantity (M. Ton)	894	783	882	730	645
--- in percent	70	61	67	55	47
Supplied by domestic formal sector (%)	30	39	33	45	53

Source: VDD, 2002 and trade survey of vegetable seeds, 2002.

High and growing import dependency

Nearly 60% of the total domestic seed demand is estimated to be met from imports. But this share is strikingly high (about 90%) for many seeds (Table 3). The important exceptions are radish, rayo (broadleaf mustard), and cress and bean (different types). When these crops are excluded the contribution of imported seeds soars to 79% (Hada and Chitrakar 2002). Two other features are worth noting. First, imported seeds predominate not only in areas around major urban centres but also in remote rural areas (Chitrakar 2001). Second, as most imported seeds are expensive, share of import would be even higher in value terms. Generally hybrid seeds (fully imported) and open-pollinated (OP) seeds of summer crops (mostly imported) are much more expensive than OP winter vegetable seeds.

Table 3: **Share of domestic and imported seeds in the Nepalese market, 2001/02**

Seed	Total sale (M. Ton)	Proportion in total sale		
		Domestic seed (%)	Imported seed	
			Hybrid (%)	OP (%) 1/
Winter Crops				
Cabbage	11	2.0	31.4	66.6
Carrot	12	2.9	0.1	70.9
Cauliflower	19	53	31.8	15.2
Coriander	37	39	9.1	51.9
Onion	61	22	0.7	77.3
Pea	113	42	Nil	58.0
Spinach	39	17	Nil	83.0
Summer Crops				
Okra	90	27	13.0	60.0
Tomato	4	25	17.9	67.1
Zucchini	2.4	15	34.7	50.3

1/ Open pollinated type.

Source: Based on trade survey of vegetable seeds 2002. See Annex Table 1 for further details.

Available data also show that the OP seeds that were sourced entirely from domestic production about a decade ago are being rapidly replaced by imports (Budhathoki et al. 2002). This is due to the lack of a varietal maintenance and improvement programme[127] leading to poorer quality of the Nepalese seeds in aspects such as germination, size and weight, colour, genetic purity and true to typeness of the variety. At the same time, hybrid seeds are becoming popular, especially among commercial growers. The data from a trade survey of vegetable seeds show that the volume of hybrid seeds sold in Nepal was about 7-8 tonnes per year during 1998-01 but the estimate for 2002 was about 19 tonnes (Table 4). As Nepal does not produce any hybrid seed, the import bill is growing rapidly. For example, the total value of import of hybrid cabbage seed alone is estimated to be about Rs 70 million in 2002. Table 4 shows balance sheet for the 1998-2002 period, including the sales of hybrid seeds in the Nepalese market while Table 5 shows areas under vegetable seeds, and the amount of improved and foundation seeds required.

Table 4: **Balance sheet of vegetable seeds in Nepal: 1998-2002** (in M. Ton)

	1998	1999	2000	2001	2002
Domestic sales	285	373	849	800	911
Total import	108	76	264	243	219
Total export	94	45	124	30	71
Domestic production	271	271	717	588	700
Sale of hybrid seeds	8	6	7	9	19

Source: Survey of vegetable seed trade, 2002.

Table 5: **Area under seeds and required volumes of improved and foundation seeds**

Year	Area under vegetable seeds (ha)	Required volume (M. Ton)	
		Improved seeds	Foundation seeds
1997/98	1,48,000	1275	80
1998/99	1,51,000	1283	81
1999/00	1,55,000	1317	83
2000/01	1,57,000	1334	84
2001/02	1,60,000	1360	86

Source: VDD. 2002.

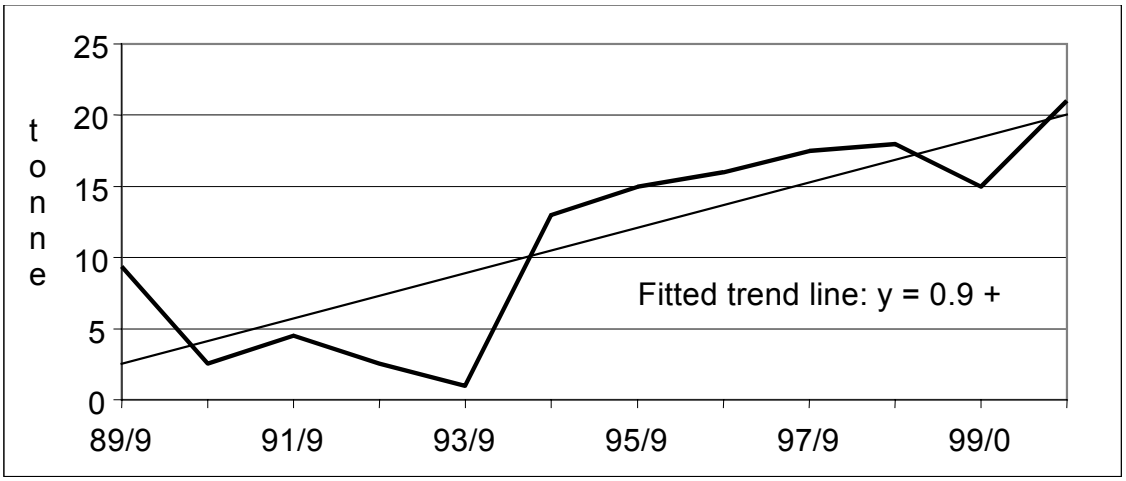
Trends in the export of vegetable seeds

In common with most other commodities, the margin of error in available statistics on the export of seeds is high as there is a great deal of uncertainty on the export to India along the long porous border. Experts hold that there is a two-way trade with India in seeds, but these exports are rarely recorded in view of their informal nature and reflecting some formidable restrictions on the import of seeds by India. On the other hand, efforts to export seeds to the third countries are well known, as well as the statistics. Figure 1 shows the trend in seeds export from Nepal. From about 4 tonnes per annum during 1989/00-93/94, the export jumped to 13 tonnes in 1994/95 and continued to grow, albeit slowly, reaching 21 tonnes in

[127] See Annex Table 2 for seeds varieties recommended in Nepal by year of release.

2000/01. The overall linear growth rate during these 11 years comes at 1 600 tonnes per year. The trade sources indicate that the destination was Bangladesh only until 1995/96, but also India thereafter. The export has been limited to only one crop - the radish seed (Mino-Early).

Figure 1: **The evolution of Nepal's export of vegetable seeds, 1989/90-2000/01**



It is known that some attempts were made by the private sector to explore markets in the Middle East for radish and other crops. Although there is no official record of any trade, some seed traders have been exporting radish seed (Mino-Early) to Qatar, reportedly about 2 tonnes (Information courtesy: Annapurna Seed, Kathmandu). This trade is entirely informal and it is said that the consignments in small packets are neither labelled nor packaged, and shipped inside checked baggage of passengers travelling to the Middle East for other business. One other recent experience is attempts to export radish seed to Thailand (Personal communication, Kastmandap Trade Point). The test result is said to be favourable, but export orders were yet to arrive. These traders also reported that there is some reluctance on their own part to commit substantive export contracts due to uncertainty about their ability to procure required volumes of seeds and in good quality.

KEY ISSUES FACING THE SEEDS SECTOR

Issues and Challenges in Import Substitution

This sub-section discusses selected issues and challenges related to import substitution of seeds. Many of the core elements of any programme on import substitution – notably increased output, improved quality and price competitiveness – are also equally important for export promotion.

***Lack of varietal development and maintenance*:** As there is no effective programme on varietal development and maintenance the release of new varieties, which was extremely slow in the first place, has practically halted. On the other hand the availability of new varieties (particularly hybrid) in the international market and familiarity to the Nepalese farmers has meant imports of these varieties. Secondly, although there is policy-provision for registering the internationally identified varieties and recommending them for production in the country its implementation

has been very weak. In deed, many of the popular native varieties are not even registered. Thirdly, demand for hybrid seed is increasing every year, whereas Nepal does not produce any hybrid vegetable seeds so far. Consequently, imported seeds increasingly meet domestic demand.

***Quality maintenance*:** Budhathoki et al (2002) report that the quality of available Nepalese seeds has been deteriorating, prompting farmers to switch to imported seeds. The main reasons for quality deterioration are identified as: i) lack of quality supervision and control during the production process and ii) unavailability of quality foundation seed. Since seed quality is largely determined at the field itself the virtual lack of supervision at the production stage means quality deterioration. Also, most seed growers are not involved at the production stage, either directly in the production process or through close supervision. This is the first issue.

Most countries have generally three types of seed quality control systems, namely Certification, Truthful Labelling and Quality Declared Seed. The Nepal Seed Act 1988 has prescribed the first two systems, whereas the "quality declared seed system" is included in the proposed amendment to the Act. None of the three systems are effective in Nepal in practice. According to the agency in charge of this function, the SQCC under the NSB, the current service of the Centre is limited to testing about 2000 samples a year. The Centre further feels that it is very difficult to effectively render this service with current structure of the SQCC. The Seed Act 1988 has also a provision for private sector participation in the formal quality control mechanism but actual involvement has been negligible.

On the second issue, i.e. unavailability of quality foundation seeds, both the DoA and NARC farms are producing foundation seed (FS) although the primary mandate of the NARC is producing Breeder Seed (BS). According to Raut et al (2001), as seed varieties are not effectively maintained in farms run by both these agencies, especially genetic and physical purity, the varieties are deteriorating. In this context Gyawali (2002) notes that Radish-seed (Mino Early), a key export item of Nepal, is produced from FS imported from Japan more than a decade ago. As a result, quality has deteriorated and Nepal’s reputation worsened in the export market (Budhathoki et al 20021). Both the DoA and NARC farms have limitations to produce the required quantity of quality FS. Besides, they are not in a position to produce FS of all crops and varieties required by the seed industry, primarily for lack of trained manpower. The private sector also lacks capacity in terms of finance, know-how and infrastructure to make substantive in-roads in foundation seed production and varietal maintenance.

***Poor post-production activities*:** Most of the seeds produced and sold in the domestic market are hand cleaned, sun dried and packed in jute or polythene bags. Grading is the only processing activity adopted so far by seed growers before selling to traders. Even this is a painstaking task for seed growers as seed processing centres are mostly located at considerable distance from growing areas. Moreover, most seed production is undertaken by large number of small farmers and it is beyond their capacity to own or access modern seed processing equipment. On the other hand, there is little incentive for individual seed traders to make invest-

ment in such plants. Due to the small size of their business, the effort is unlikely to be profitable.

Poor packaging: Generally Nepalese seeds are packaged in crude form. In retail markets, they are sold in transparent polythene pouches unlike imported seeds. Reportedly, this is luring local seed buyers to purchase imported seeds even when the same cultivars of Nepalese seeds are available (personal conversation Shristi Agrovet, Palpa). Some traders even claim that Indian traders from nearby areas buy loose seeds from Nepalese markets to repack and sale in Nepal (Courtesy: Mechi Agrovet, Birtamod). This practice is detrimental for establishing goodwill and reputation of the Nepalese seeds. There has been some improvement in this regard after the enforcement of "truthful labelling" prescribed by Nepal Seed Act 1988. Recently, several seed traders have initiated marketing Nepalese seeds in their own label with “truthful labelling”. Yet, evidences show that the traders sell seeds in loose form when the products do not meet the set standard.

High production cost: Seed traders/exporters lack their own production base and do not get engaged in production activities. The prime mode of obtaining the supply of vegetable seeds is through contractual agreement with seed producers' groups. Although in several cases the contract is made for bulk amount, the implementation of the contract at the farmers’ level is usually carried in scattered and smaller plots, which is not cost effective. Consequently, there is an absence of the economies of scale at the production level regardless of the contract volume. This together with higher transportation cost from the production areas (mostly hills) means that per unit cost of the produce rises significantly. This has made the price of the Nepalese seed more expensive compared to imported (mostly illegally) seeds from India. As an example, a contract price of Rs.50/kg was not acceptable to Nepalese seed growers for *Pea Arkel* while the same seed was supplied in the market by Indian traders at Rs 40 - 45/kg.

Challenges in Export Promotion

Nepal-India trade and transit treaties created some opportunity for Nepalese vegetable seed exports to India, where the market is estimated at between 12 000 and 16 000 tonnes a year. Stimulated by these opportunities, several seed traders also exported seed to Bangladesh and other countries. Unfortunately, the new trade and transit treaties do not formally recognize vegetable seeds as an export product of Nepal. As a result, seeds export to India has been taking place in some disguised form. For this reason, there is no official record of the amount of seeds actually exported to India. In fact vegetable seeds export to India is discouraged. But for Nepal India will remain an important outlet, as India’s seed requirements are massive. On the other hand, the total seed demand in Bangladesh, the main export market so far, is fairly small in relative terms.

As stated earlier, export competitiveness is also influenced by similar factors as import competitiveness, like the ability to produce and supply seeds as demanded and at competitive prices. In addition, export competitiveness is also affected by policies in exporting countries. Notwithstanding repetition, selected constraints and issues related to production and export of seeds are discussed below.

***Lack of varietal development and maintenance*:** For more than one decade, seed export from Nepal has been mostly limited to one product, radish Mino Early. The major buyers have been traders from Bangladesh. At home, there is no formal breeding programme for vegetable crops. Varieties developed by international seed companies and international institutions are introduced, tested and recommended for cultivation. To date, only 38 cultivars have been released (only two varieties registered) and recommended by the government. Of these, 11 varieties came from local selection while the rest were introduced. The process of the varietal development and release of seed varieties seems to have stagnated as no new seed variety has been released since 1994 (Annex Table 2). Even popular native varieties are not registered, e.g. cauliflower (Jyapoo) and Spinach (Patane). On the other hand, there are some examples of the native Nepalese varieties being produced and marketed by foreign companies.[128]

Due to the absence of a varietal maintenance and breeding programme the quality of many released cultivars are deteriorating (Raut et al. 2002). There are instances of the rejection by Bangladesh of the exported radish seed on ground of poor quality. The NARC and DoA farms are frequently blamed for not maintaining varieties and providing quality FS in adequate amount to the private sector[129].

NARC is constrained by lack of qualified staff and budget for seed research, varietal development and production. But the complaint has been that research is virtually lacking, apart from some production of breeder, nucleus and foundation seeds which are also not up to the standard (Budhathoki et al 2002). A few private companies have made efforts to manage source seeds for their production programme. Given the constraints facing the public sector, bringing private sector in this activity is the only other option. Some of the constraints facing the private sector include dearth of technical manpower, small scale of production and financial constraints. In view of this, collaboration with foreign seed companies is increasingly seen as a way out, as has been done by a company.[130]

***Lack of price competitiveness*:** As with many commodities, the cost of production of seeds is high in Nepal, making it difficult to compete in both domestic and export markets, at the same time suppressing demand from growers. On the other hand, Table 6 shows that the contract price of major seeds has been rising markedly, and irrespective of the export price. Traders interviewed in the course of

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[128] While Nepal has released only one variety of chili, Jwala, so far a seed company in California, USA is marketing two varieties of chillis of Nepali origin in the names of *Nepali Orange* and *Nepali Large Red*.

[129] VDD's estimation of the FS requirement appears substantially higher than estimates by other sources. For example, one study estimated the FS requirement for 2001, for on a given volume of seed production, to be only 21 tonnes (even allowing for a large margin of error), versus 85 tonnes estimated by the VDD. However, government farms were able to produce only 14 tonnes, substantially less than the estimated 21 tonnes.

[130] A foreign company registered in Nepal has been a successful seed exporter of Nepal since 1994, regularly exporting vegetable seeds to Bangladesh, India and also Japan (occasionally), in addition to casual export of lentils to Bangladesh, niger seeds to US and coriander seeds to India. The company conducted hybrid seed production of Tomato, Cucumber, Okra, Bitter gourd and Capsicum from 1996 to 1998 with technical support from a India based company. Different lines of some crops and varieties were tested, and some of the better performers were screened also. But, the programme was discontinued due to the withdrawal of the Indian partner's support as the latter separated from its Netherlands-based joint venture Company.

this study reported that this is a major reason for some of them to abandon the seed export business despite having been involved for several years.

Table 6: **Weighted average contract price of selected seeds in Lumle seed production area** (Rs. per Kg.)

Crops	1999/00	2000/01	2001/02
Radish Mino-Early	80	90	100
Radish 40 days	69	78	85
Rayo Marpha Broad Leaf	107	125	201
Cauliflower (Kathmandu local)	320	352	370
Carrot New Kuroda	250	No contract	No contract

Source: SSSP internal reports.

The contract price is high because production costs are high, including for the main export product, radish. As a result, even higher contract price does not provide enough margins for seed growers. Table 7 shows cost of production (COP) in relation to contract price for selected crops. Being poorly linked to the market, seed growers do not know about price trends and thus expect higher prices every year. This creates difficulties for exporters whenever the export price falls. When faced with such a situation, traders contract in new areas and at lower price, or forego any attempt to contract production. This situation may improve if traders themselves get involved in production activities.

Table 7: **Cost of production and contract price for selected vegetable seeds**

Crop	COP[1/] (using family labour)		COP[1/] (using hired labour)	
	Rs/kg	COP as % of contract price	Rs/kg	COP as % of contract price
Radish (Mino Early)	53 - 59	56 - 59 %	69 - 87	77 - 84
Radish (40 days)	45 – 49	63 - 68 %	60 – 65	84 - 89
Cauliflower	82 – 94	46 - 53 %	117 - 131	66 - 74

1/ Cost of production

Source: Estimated COP and contract price data for 2000/01 in Eastern, Western and Far-Western areas, based on Mallori (2001).

Concentration of seed traders in trading only: Seed traders, including exporters, are only involved in trading with little or no involvement in production activities. In most cases, contracting traders do not even supply the required FS to farmers, and thus have poor or no control over seed quality from the farmers. On the other hand, farmers are neither aware nor much concerned about quality demanded in the export market. Therefore, it is essential that seed exporters be involved in some way in the production stage also.

It seems that in the formation of retail price, seeds behave as non-traded commodities. Thus it is unusual to find the prices of local seeds to be out of line from import and export parity prices. Rather, these local prices often reflect supply price or cost of production. For example, in a recent period, the price of onion seed (Red Creole) imported from India was about Rs175/kg in local markets, while the cost of the same seed variety from Nepal was above Rs 400/kg, and onion Mallaj (native variety) was priced at about Rs1000/kg in local markets. This behaviour,

which remains largely unexplained, has often caused misunderstanding between farmers and traders.

In fact, seed traders are yet to emerge as seed companies. A good seed company possesses facilities for R & D, quality control and market promotion measures with its own brand name and variety. In this regard, the emergence of the SSSC can be considered to be a positive development. The success of the SSSC will have important implications for further developments of the Nepalese seed sector.[131]

Cost of packaging in the price of seeds: Nepalese products are generally exported in gunny bags, which is not appropriate for establishing brand reputation. Establishing brand reputation is crucial, not only to retain the market but also to deter traders from other countries exporting, falsely, as Nepal produced. Establishment of brand reputation is also important for traders/exporters to enjoy market price as per demand and quality of the products. Moreover, as long as seeds are exported in crude form, particularly to neighbouring countries, the possibility of re-export (most likely in processed and better packaged form) will always be there. In fact, the Nepalese seed traders from border areas claim that seeds exported to India are imported back after processing and packaging.

Nepalese exporters also complain that high costs limit better packaging practices. At present, the packaging cost for one kilo of Mino Early radish (in printed aluminium foil packet) is about Rs30, or nearly 25% of the market price in Bangladesh. Nonetheless, experiences show that Nepalese seeds could command prices higher enough to profitably recover the packaging cost, if better quality of the merchandise could be assured. This was the case with the recent export by SSSC to Bangladesh. For the first time, the SSSC exported to Bangladesh 3 tonnes of radish Mino Early seeds in 400 gm packets and fetched better prices. Further, the SSSC has received a new order of 8 tonnes for the coming season[132], as importing parties were satisfied with the seed quality.

***High freight cost*:** One issue where Nepal needs to work harder is negotiating with India for permission to export seeds through land route. Shipping seeds by air can be expensive.[133] The Indian government prohibits the entry of any kind of propagating materials including seeds other than from five designated points, namely Amritsar, Kolkota, Chennai, Mumbai and New Delhi. All these entry points are accessible to Nepal only by air. For Nepal, the opening up of export through land border points would be a big factor in the export growth of the seeds sector. This should also be a significant incentive for foreign seed companies to operate in Nepal (see below). In view of these potential gains, Nepal should consider this matter seriously in Indo-Nepal trade negotiations.

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131 The SSSC is a private limited company with several big seed traders as shareholders. The Centre has its own laboratory for testing seeds and technicians. Currently, it is trying to produce hybrid seed with the help of NARC. The SSSC is supported by DFID.

132 SSSP project co-ordinator office.

133 At present airfreight for 1 kg of radish seed to Bangladesh from Kathmandu costs $ 0.30 (about Rs 23).

***Hybrid seed production programme*:** There are some good reasons for Nepal to consider initiating a substantive programme on hybrid seeds. Besides the import substitution rationale, it is imperative to diversify the range of seed varieties in order to strengthen export prospects. At this stage of Nepal's development, this may sound too ambitious. Yet, prospects for Nepal encouraging international seed companies to start business in Nepal are good. One key economic incentive for them would be export opportunities to India and elsewhere. Nepal's natural agro-ecology could be a very attractive factor for producing high quality seeds. Moreover, Nepal's WTO membership is also a positive factor in that the intellectual property of seed manufacturers will be secure. Lastly, there is now a critical mass of private sector in Nepal with some experience and interest in the seeds business.

Issues on Nepal's Policies and those of Importing and Transit Countries

***Domestic policy*:** Nepal does not have any specific policy on seeds as an export commodity. As a result, there are no preferential treatments on exports, e.g. cargo priorities, quarantine facilities, special transport arrangements and so on, despite the importance of timeliness and delicate nature of various forms like bulb, corn, tuber, plant parts and seedling/saplings etc. Moreover, there are no special banking provisions on credit financing to support, for example, pre-export financing and infrastructure development for the seeds industry.

***Vegetable seeds in trade agreements*:** Vegetable seeds are not explicitly listed as locally produced goods eligible for preferential treatment in the export to India, under the Indo-Nepal trade agreement. Yet, seeds deserve that status, being primary agricultural products, i.e. without any simple or advanced industrial processing. India is a huge market for seeds, estimated at between 12 000 and 16 000 tonnes. Access to even a very small proportion of this market would be substantial for Nepal. Therefore, the government should work towards explicitly including vegetable seeds in the list of commodities with preferential market access.

***Policies and regulations of the government of India*:** There are several issues affecting Nepalese seeds export, but two of the Indian policies stand out: insufficient entry points and Indian quarantine fee. On the first issue, India, under the prevention of destructive insects and pests Act, permits the import of seeds from only five designated points, namely Amritsar, Mumbai, Kolkotta, Chennai and New Delhi, all of them accessible to Nepal by air only. Thus it prohibits the entry of vegetable seeds from all Indo-Nepal border points. Exporting seeds to India by air, that also through distance airports, considerably erodes price competitiveness. Although illegal, some exports take place through border points. Being illegal there could be substantial transaction costs.[134] Box 1 narrates an experience.

[134] On their field visits, the authors observed that most of the agro-vets operating in the market areas of the eastern Tarai export Nepal produced seeds (mostly in loose form) to India through Indian middleman and/or shopkeepers. Annual export of most of these agro-vets was found to exceed one tonne, and the major seed varieties were radish Mino Early and radish "40 days". Some traders also reported selling Nepalese cress, rayo and french bean in smaller quantities (less than 100 kg) to Indian traders and farmers in border areas. The visited agro-vets were Mechi agro veterinary and Pasupati Krisi Bhandar of Biratmod Jhapa, and Purwanchal Agro vet, Sidhhakal Agro vet and Deepika Krisi Kendra of Biratnagar.

Box 1:

Barriers to the export of vegetable seeds to India from land customs points

At one time, a Nepal registered private joint venture company received an order for 5 tonnes of radish and 2 tonnes of coriander seed from Indian traders. The Indian parties had supplied required volumes of source seeds for seed production. As the company collected the harvest from its contract farmers and initiated the export formalities, it faced the no-entry barrier through land routes. As airlifting was not found to provide adequate margins for the OP seeds, the entire harvest was stocked. Reportedly, the Indian quarantine officials at border points had stated that even if seed samples were tested in designated quarantine labs and cleared, the officials would deny entry permit unless authorized fresh from the government. The company was not aware of the regulation, as it was previously exporting small volumes of seeds to India through land routes. This is somewhat surprising that HMG officials as well as private seed exporters were oblivious of this Indian regulation, although notification was made in 1990. This issue was not raised by Nepal in recent joint interactive meetings on quarantine regulations of India, organized by Nepal's Department of Agriculture and FNCCI.

The second issue noted above is Indian quarantine fee. The new fee applied by India is high when compared with the market price of Nepal's major exported seed, namely Radish Mino Early. The fee is charged on the basis of volume of a consignment as shown in Table 8. The Nepalese traders hold that this quarantine fee has eroded the competitiveness of the Nepalese seeds in the Indian market.

Table 8: **Quarantine fees charged by India for seeds for sowing**

Regime	Volume	Rate in Indian Rupees
Old rates	Up to 100 Kg.	1/Kg.
	From 100 to 1,000 Kg.	0.50/Kg.
	Above 1,000 Kg.	0.20/Kg.
New rates	Up to 1 Kg.	100
	From 1 Kg. to 100 Kg.	100 + 15 per additional Kg.
	From 100 to 500 Kg.	5,050 + 15 per additional Kg.
	Above 500 Kg.	11,050 + 5 per additional Kg
Rates Proposed by Nepal	Up to 1 Kg.	50
	From 1 to 100 Kg.	50+ 5 per additional Kg.
	From 100 to 1,000 Kg.	550 + 3 per additional Kg
	Above 1,000 Kg.	4,000

Source: Government of India notification of 14 June 2002, and Plant Quarantine Section, Department of Agriculture, Lalitpur, Nepal. Source: Clause 12, schedule (iii) of PFS order, 1989, as amended by S.O 467 (E), 16 May 2000 and S.O 574 (E) dated 14 June 2000.

The new rates are very high compared to the rates prior to the June 2000 notification, which were only one Indian rupee for consignment up to 100 kg and additional IRs 0.50/g for volumes above 100 kg up to 1000 kg, and IRs 0.20/kg for volumes above 1000 kg. Compared to market price (IRs 50/kg) for radish (Mino Early), the new quarantine fees are more than 100% for consignments up to one kilo, and 10% of the market price. It is obvious that inspection fees are high for the export of vegetable seeds to India.

An experience in 2002 reveals the nature of the problem. The SSSC then received an import order of 10 tonnes of seeds of radish (Mino Early) from four Indian

parties (from Bareli, Faridabad and New Delhi). The parties agreed on price, quality and other costs, but asked SSSC to bear the cost of the Indian quarantine fee and delivery to India. The SSSC did not agree on the quarantine fee, as this would not give adequate profit margin. As a result, the deal was aborted. Also importantly, even if there was an agreement on this, there was the hurdle of India's requirement that seeds cannot be imported from land routes.

One way to reduce the burden of the inspection fee is to export in bulk. This cost can also be reduced by producing/exporting higher value seeds such as onions, carrot etc. Yet another option would be to improve the capability of the central seed-testing laboratory (CSTL) so that itbecomes a competent body to issue an ISTA (International Seed Testing Association) certificate. The return to this investment is high in the long term.

CONCLUDING REMARKS

Nepal has considerable scope for producing a wider range of vegetable seeds for export and domestic markets by virtue of the wide agro-ecological diversity. The analysis of production and trade statistics in the first Section brought to light a number of facts and issues. First, Nepal is a net importer of vegetable seeds. Second, there is a fair degree of consensus that Nepal has high potential to substantially reduce import dependency. Third, while Nepal will have to import certain seeds, there are also good potentials to export certain varieties of seeds. Thus, the seed strategy and policies have to be supportive of efforts towards both import-substitution and export promotion.

Many factors constrain the realization of the potentials. These constraints were discussed under the following three groups: i) challenges to import substitution; ii) challenges to export promotion; and iii) government policies of Nepal and those of the importing countries. The focus of the presentation in that section was on issues and constraints, and so on the identification of areas for improvement. In view of this, the many suggestions made there are not repeated here.

Basically, the improvement measures fall into three categories. First, there are issues of high production cost and poor post-production activities, a feature common to all commodities in Nepal. Apart from rural roads etc., issues on research and extension fall into this category. Second, there are many avenues for supporting the public-private partnership. One recurring theme was the importance of the linkage between seed traders and farmers. The question asked was why seed traders have little incentive to connect to farmers to produce quality seeds and in the amount required. The MoAC needs to investigate this aspect, focusing on the incentives framework, and aimed at identifying policy or other impediments. Removal of some of them may be within the jurisdiction of the government. Third, there is the issue of exporting seeds, in particular to India. Nepal had some experience with providing some incentives (subsidy) in the export of seeds to Bangladesh, which seems to have worked then. However, there is virtually no analysis of the experience that would suggest whether this made an overall economic sense. The WTO Agreement on Agriculture allows developing countries to provide transport subsidies, but the main issue is whether this makes an economic sense.

In contrast to other agricultural commodities, seeds have not benefited from the opportunities that the Indian market presents. One key obstacle is quarantine-related laws and practices of India that are very restrictive on propagating materials, which include seeds. Nepal has little choices other than negotiating with India to relax market access terms. Nepal needs to be sensitive to Indian concerns on plant protection. Nepal needs to convince India that the Nepalese seeds are safe. This in turn requires adhering to plant protection guidelines of the IPPC, as well as India's specific guidelines if there are differences, and upgrading testing facilities.

In addition, Nepal should try to include seeds as one of the export commodities in the appropriate protocol of the Nepal-India Trade Treaty. Currently, seeds are not explicitly included in the list of locally produced items eligible for preferential treatment under the treaty.

Nepal also needs to do a lot of homework aimed at attracting foreign investment in the seeds sector. This home work would include, to start with, some debate in Nepal on the pros and cons of such a strategy, contacting foreign seed companies including from India to understand their perceptions and concerns, and introducing appropriate intellectual property rights to breeders and seed companies in the *sui generis* legislation being formulated as pat of the TRIPS Agreement.

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Table 1: **Demand for vegetable seeds in the domestic market, 2002**
(In M. Ton)

Crop	Sales in domestic markets			
	Total sales	*Inter- firm trade*	*Total consumption/demand*	*Imports*
Cauliflower	19.3	3.89	15.4	5.6
Radish	400.8	105.22	295.6	9.5
Mino Early	259.0		259.0	0.0
Rayo	30.2	6.16	24.0	0.0
Turnip	6.1	0.40	5.7	0.8
Carrot	12.3	2.55	9.8	6.2
Bean	190.6	17.12	173.5	5.7
Cress	34.5	6.66	27.8	1.6
Cowpea	47.1	16.21	30.8	6.4
Spinach	39.2	6.72	32.5	26.0
Pea	113.5	17.48	96.0	48.5
Tomato	3.8	0.93	2.9	1.9
Coriander	36.7	9.19	27.6	13.1
Brinjal	4.3	1.03	3.3	0.0
Capsicum	1.8	1.03	0.8	1.5
Bhindi	90.2	0.33	89.8	45.1
Cucumber	4.9	0.76	4.1	1.9
Sponge gourd	2.3	1.11	1.2	1.4
Cabbage	11.3	0.71	10.6	6.9
Onion	61.0	4.33	56.6	29.4
Bittergourd	0.3	1.13	-0.9	0.1
Bottle gourd	2.2	0.14	2.0	1.0
Pumpkin	0.1	0.02	0.1	0.1
Knolkhol	0.1	0.05	0.0	0.0
Swisschard	0.1	0.11	0.0	0.0
Total	1376.83	241.65	1135.2	241.6

Source: Trade survey of vegetable sees, 2002

Annex

Table 2: **Verities released and recommended in Nepal**

S. N.	Crop	Variety	Released Year
1	Cauliflower	Sarlahi Dipali	1994
		Dolpa Snowball	1994
		Kathmandu Local	1990
2	Radish	Dhankuta	1994
		Tokinasi	1994
		40 days	1994
		Puthaned Red	1994
		White Neck	1994
		Mino Early	1990
3	Turnip	Purple Top	1994
4	Rayo (Broad leaf Mustard)	Tankhuwa Red	1994
		Khumal Broad Leaf	1994
		Khumal Red Leaf	1994
		Marpha Broad Leaf	1994
5	Onion	Red Creole	1990
6	Tomato	Pusa Ruby	1990
		Roma	1994
		Man Precus	1994
		NBL	1994
7	Cabbage	Copenhagen Market	1993
8	Carrot	Nantcs Fort	1990
9	Bean	Trisuli	1994
		Jange	1994
10	Asparagus	Sarlahi Tane	1994
		Khumaltane	1994
11	Pea	Sarlahi Arkel	1994
		Sikkine	1994
		New Line	1994
12	Capsicum	California Wonder	1994
13	Chili	Jwala	1994
14	Brinjal	Nurki	1994
15	Sponge gourd	Kantipur	1994
16	Cucumber	Kusle	1994
17	Squash	Absave	1994
18	Swish chard	Susaag	1994
19	Bitter gourd	Hario Karela	1994
20	Okra	Parvati	1994
21	Spinach	Haripate	1994

Source: NARC 2002.