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SEED PRICING

A REPORT BY

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Abbreviations Used

ADB	Agriculture Development Bank, Nepal
ADO	Agriculture Development Officer
AIC	Agriculture Inputs Corporation
APROSC	Agricultural Projects Services Centre,
DOA	Department of Agriculture
FAO	Food and Agricultural Organization of the United Nations
GTZ	German Agency for Technical Cooperation
HMG/N	His Majesty's Government of Nepal
HYV	High Yielding Varieties
IADS	International Agricultural Development Service
ICP	Integrated Cereals Project
IRDP	Integrated Rural Development Project
JTA	Junior Technical Assistant
MOA	Ministry of Agriculture
PC	Peace Corps
SPIS-SPISP	Seed Production and Input Storage Project
STIP	Seed Technology and Improvement Program
USAID/AID	United States Agency for International Development.

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EXECUTIVE SUMMARY

There are three major aspects of the report.

1. A review of the existing situation along with selected data specific to seed marketing and pricing.
2. An analysis of short and long run effects of current seed policy.
3. A discussion of policy options that could stimulate seed production, marketing, and consumption.

I. Existing Situation

The major portion of the formalized seed program is in the public sector. Production of seed is carried out by the use of contract farmers through the seed division of AIC. Foundation seed is provided by DOA.

Prices are established on a district by district basis, with a base price set by committee, a premium is allowed based on quality and charges are added for conditioning and distribution.

The method used for pricing is sound; however the weight assigned to the specific categories needs to be addressed.

Seed certification and testing are handled by STIP of DOA. Quality premiums are based on the STIP test results.

II. Short and Long Run Effects of the Current Price Policy

The present pricing system encourages production of seed by farmers since the base price is usually significantly higher than the grain price at collection time and the premiums add significantly to the price (up to 30-35 percent).

Costs added to the procurement price (although lower than actual costs) make prices high to farmers. The relatively high price results in lesser amounts being used by farmers. The current system sometime results in different prices being charged for different lots of seed. This causes confusion among purchasers and has a detrimental effect on the confidence in AIC seed. Lowering of prices during the season also has an unsettling effect on consumers.

The current system has the effect of both encouraging and discouraging private enterprise. If AIC prices are known but the private venture is isolated from the AIC store the high price for seed encourages private venture. If AIC has a store, where farmers can sell seed, the current system discourages private venture since the margin between prices paid by AIC and the prices at which seed is sold are insufficient to cover the risk associated with private venture (especially if a private seller feels that AIC may drop the price).

The quality problem associated with the current system makes a true assessment of the pricing system very difficult. Both price and quality affect sales.

In the long run the current system should encourage production of seed by farmers since seed production probably results in higher returns than other alternatives. Under a highly subsidized system, faster growth of both public and private sectors of the industry can be expected provided certified seed of both sectors is subsidized.

Different prices for specific lots and arbitrarily dropping prices during the season both have negative long run effects. These practices should be changed. Lots of seed of the same variety should have the same price at a given location. Prices should be lowered, after the planting season.

III. Policy Options

Continue Current Policy

A continuation of the current policy would result in an improved seed industry since there has been definite improvements under the existing policy. If the quality problem is improved the true effects of the current policies could better be analyzed.

Modification of the Current Policy

Using the same policy but restructuring the premium rates paid and commissions could conceivably maintain a supply of good seed, increase commissions to sellers, and lower the price of farmers. This I feel should be carefully considered and addressed.

Another option would be to to maintain the high prices to seedsmen and lower prices to farmers with HMG contributing more subsidies. Commission rates should be more in line with costs of sales. This option would probably have the positive results of high quality seed being produced and more seed being used by farmers but would result in higher costs to HMG/N and donors.

Have Separate Policy for the Terai and Hills

There are separate problems therefore separate policies are an option for the two areas. A greater privatization of the hill seed industry is a worthwhile goal. This could be done by subsidies to private organizations or individuals meeting specified requirements. Facilities (buildings, subsidized bins), supplies at reduced rates and transportation subsidies could be handled through AIC. Sources of replacement stock should continue to come through AIC.

AIC Handle only Certified Seed

This option would probably result in an improved quality of seed being provided since specifications for certified seed command higher quality. This is a worthwhile goal but at the moment seems to be a long run goal.

Regardless of which alternative option is chosen there are several factors that must be considered so that price policy has a chance to work. An internal quality control program should be established beginning with a record keeping system to be able to monitor quality. Improvements need to be made in the support systems providing foundation seeds and testing to help AIC if a quality seed is to be an end product. High priority should be given to breeding program and variety trials so that new HYV varieties adaptable to Nepalese conditions can be found.

Training of personnel should continue to receive high priority from HMG and donors to the Nepalese seed program.

CONSULTANCY REPORT ON SEED PRICING

1. Introduction and Existing Situation

1.1 Introduction

The terms of reference for this consultancy were as follows:

1. Review the existing situation to collate the available information regarding economics and costing of cereal seed production, processing storage, and marketing.
2. Hold discussions at various levels for an understanding of the factors that currently influence price setting.
3. Assess the short and long-term effects of the present pricing system to identify guidelines for decision making.
4. Through the consultancy report, advise on the policy options that could stimulate seed production and marketing as well as enhance the consumption of improved seed by more and more farmers."

Also stated in the terms of reference are the following statements

"Experience has shown that farmers use of improved seed to increase food production depends, in a large measure, on the price at which seed is sold to them. Farmers would buy seed if the price is affordable (and quality is assured). The seed business should not, however, be a source of loss to a seeds organization. Price subsidy, in any event, would appear to be a temporary prop that provides no lasting solution".

In the enclosed report, sections addressing the seed quality and subsidy issues are included. In addition each of the four listed specifics have been addressed.

In the past year four specific documents have been compiled by SPIS Project and or Consultants that provide much of the background information included in this report. These are:

1. Document on National Seed Program and Consultancy Report by Dr. J.E. Douglas
21 February - 12 March 1983.
2. Seed Program Development Strategy
Papers presented at the First National Seed Seminar
February 16-20, 1983.
3. Mini-Seedhouse Operation for Hill Seed Production and Supply in Nepal
SPIS/AIC, July 1984
4. Marketing and Pricing Policies to Strengthen The National Seed Program and Support the Seed Production and Input Storage Project,
APROSC, 1984

1.2 Existing Situation

Information specific to costs of production, processing, storage, and marketing are very limited. AIC does not keep the kinds of records whereby these data are easy to collate. Much of the type data that would be useful is either not regularly published or is simply not available.

Data on the indices of market prices and some specific market prices can be found in the Agricultural Marketing Information Bulletins published by the Food and Agricultural Marketing Services Department. Baseline data used for the marketing informatic.. publication is available, however not in a regularly published form. Some of these data were used to look at the seasonal variation of prices discussed in a later section of this report.

The first National Seed Seminar held at Kathmandu from February 16th to 20th, 1983 contains an excellent set of papers. From this document (much used by J.E. Douglas) one can derive the "state of the art" of Nepal's seed industry. In addition the participants are to be commended for their candid remarks about problems in Nepal's seed industry. Included as Annex C of this report are references and copies of sections of papers dealing with marketing and pricing of seed in Nepal.

1.2a Current pricing system and distribution

In the paper, Seed Pricing, Subsidy and Related Issues by Dr. B.N. Kayastha (then Chief of the seed division) a brief description of the AIC pricing system was presented. More detail is presented throughout the report. The system presented was:

Seed Pricing System of AIC

"Production Cost

1. Procurement cost: This cost includes base price of collection price and premium percentage given to the seed growers according to their seed quality. This will include loading and unloading.

2. Processing cost: This cost will include labour, electricity, agro-pesticides used to treat the seed and seed packaging material. At present the depreciation cost and maintenance cost of the equipments are not included in the processing cost.
3. Storage cost: No storage cost or maintenance is added in seed by AIC.
4. Transportation cost: Transportation cost is added on actual cost basis. Transportation cost is subsidized in the remote hills upto the district headquarter. This cost also includes loading and unloading in subsequent godowns.
5. Other costs: Refer to shortage (losses) at the rate of 2 percent, incidentals 2 percent and administrative expenditures 3 percent.
6. Dealers commission: This is 6 percent of the seed selling price.
7. Sales promotion and interest rate: No cost is added for sales promotion and no interest is added." (pp 277-278, 2)

Other aspects of the policy are shown in Annex C in excerpts from the paper.

In the publication Mini-Seedhouse Operation for Hill Seed Production and Supply in Nepal presented by S.S. Bal (and a paper of the Seed Seminar) the seed system is described as follows:-

"Various steps involved in the system followed by AIC are indicated below.

- a. Foundation seed is produced by the coordinated crop programs and government farms (DOA).
- b. Farmer-seed producers are selected by AIC.
- c. Contracts negotiated between AIC and farmers.
- d. Foundation seed delivered by DOA to AIC and then to cooperating seed growers.
- e. Seed planted and crop grown and rogued by farmers.
- f. Field inspections by Seed Technology and Improvement Program of DOA to check for varietal purity, isolation, roguing, diseases and weeds.
- g. Seed crop harvested, dried, and cleaned by farmers.
- h. Harvested crop inspected and samples taken by Seed Technology and Improvement Program of DOA.
- i. Crop seed delivered to AIC for processing if it appears to be satisfactory in quality.
- j. The farmer is paid local market price plus 15 percent premium upon delivery.
- k. Sample of the processed seed is analysed by Seed Technology and Improvement Program of DOA and results delivered to AIC.
- l. Premium calculated on the basis of analysis and farmer is paid upto 20 percent more premium on the basis of quality of seed delivered.
- m. AIC completes processing and packaging.
- n. Certification tags are issued.
- o. Seed is placed in short-term storage by AIC.
- p. AIC is authorized to sell and deliver seed after re-checking germination.

- q. Seed moved to distribution warehouses and country sale points.
- r. Seed sold to dealers.
- s. Seed sold to farmers.

These steps basically apply to the production of certified seed. Another category of seed produced and supplied by AIC is known as improved seed which is the progeny of certified-II class of seed and is field inspected by Aic staff themselves. Improved seed bears a yellow label. The premium paid in this case is a maximum of 30 percent and not 35 percent." (pp 4-5, 3)

The pricing mechanism used for seed pricing and distribution are described above. The system as it is has two major subsidy elements. The first is in prices and the other is in the costs area. It can be argued that prices are not subsidized and that prices paid are premiums to induce good seed production.

Prices to seed producers are at levels above grain prices which is as it should be. The level of price contains several elements:

1. Base price based on high price
2. Premiums for quality
3. Political premium

Data on price indices published by the Food and Agricultural Marketing Service Department, Marketing Services Division, were analyzed to see the seasonal price variation of wheat, corn and rice. The data

were analyzed on a crop year basis beginning at harvest with the wheat crop year calculated beginning with the Nepali month Baisakh (April-May). For corn the analysis was made using the assumption that the main crop year began with the Nepali month Bhadra (August/September) whereas the beginning month for rice was assumed to begin in Kartik (October/November).

Six years data were available for wheat and five years data for corn and rice beginning with the Nepali calendar year 2035 (1978-79). The indices of national monthly retail prices are based on the average of the 21 districts namely, Kathmandu, Parsa, Chitwan, Dhanusha, Morang, Jhapa, Rupendehi, Banke, Kailali, Surkhet, Dhankuta, Doti, Palpa, Nuwakot, Illam, Ramechhap, Bhojpur, Rolpa, Jumla, Achham, and Kaski. Historical data by district should be available but it was not obtained on this visit. These data would be valuable if a methodology change to determine base prices were to be forthcoming.

The calculated seasonal indices of monthly prices for wheat were as follows.

<u>Wheat</u>		
<u>Month</u>		<u>% variation from annual average price</u>
April/May	(Baisakh)	- 8.5
May/June	(Jestha)	- 11.8
June/July	(Ashad)	- 5.1
July/August	(Shrawan)	- 2.5 (Range 18.4%)
Aug/Sept	(Bhadra)	- 6.5
Sep/Oct	(Aswin)	+ 2.1

Oct/Nov	(Kartik)	+ 3.9
Nov/Dec	(Marga)	+ 4.1
Dec/Jan	(Poush)	+ 6.3
Jan/Feb	(Magh)	+ 4.8
Feb/Mar	(Falgun)	+ 6.6
Mar/Apr	(Chaitra)	+ 2.7

The monthly average price versus average price for the crop year for Rice is as follows:

Rice

<u>Month</u>		<u>% variation from annual average price</u>	
Oct/Nov	(Kartik)	- 14.5	
Nov/Dec	(Marga)	- 17.4	
Dec/Jan	(Poush)	- 17.2	
Jan/Feb	(Magh)	- 6.3	
Feb/Mar	(Falgun)	- 4.3	
Mar/Apr	(Chaitra)	- 3.5	(Range 40.0%)
Apr/May	(Baishak)	+ 5.3	
May/June	(Jestha)	+ 13.3	
Jun/July	(Ashad)	+ 5.6	
Jul/Aug	(Sravana)	+ 22.6	
Aug/Sept	(Bhadra)	+ 9.2	
Sep/Oct	(Aswin)	+ 8.4	

Corn

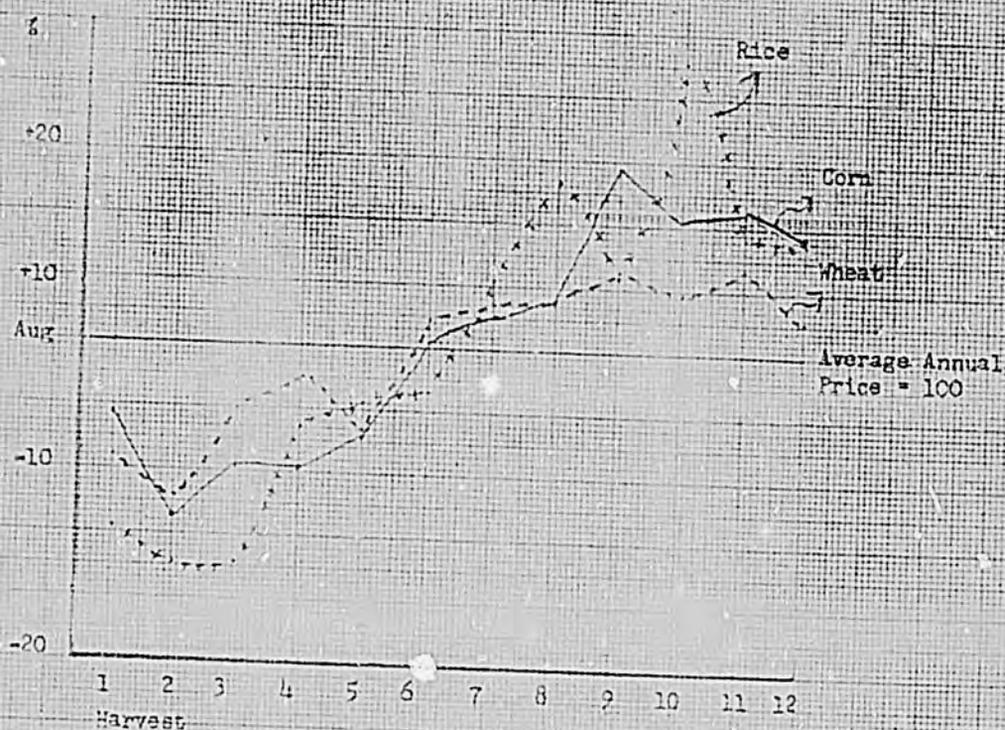
Aug/Sep	(Bhadra)	- 5.5	
Sep/Oct	(Aswin)	- 13.6	
Oct/Nov	(Kartik)	- 9.3	
Nov/Dec	(Marga)	- 9.6	
Dec/Jan	(Poush)	- 7.1	(Range 27.9%)

	<u>Crop Year</u>	<u>% variation from annual average price</u>
Jan/Feb	(Magh)	.3
Feb/Mar	(Falgun)	2.7
Mar/Apr	(Chaitra)	4.2
Apr/May	(Baishak)	14.3
May/June	(Jestha)	10.3
Jun/July	(Ashad)	11.4
Jul/Aug	(Shrawan)	9.2

The data on wheat reveal that on the average the high and low prices ranged about 18% over the past six years. The range for rice and corn were 40 and 28% respectively. Prices were lowest during and immediately after harvest for all crops which is to be expected. These results are shown in Figure 1.

Thus, if the highest price is selected as is supposed to be the case the seed farmers have a subsidy equivalent to storage costs until the highest price is received. High and low prices are not always consistent from year to year but one could conclude that farmers who produce seed are receiving a premium for seed using the "high price" concept.

Premiums paid for quality can sum as high as 35% for certified seed and if they are based on the "high price" this would inflate the premium for seed as compared to selling his excess produce (seed would fall in this category) for grain at harvest. One official stated the farmers received an average of 20% premium.



Rice Harvest = Oct/Nov - Wheat Harvest = April/May
Corn Harvest = Aug/Sept

Figure 1. Average Seasonal Price Variation From 2035-2041
For Rice, Wheat, Corn, Nepal.

Source: Agricultural Marketing Information

— Corn
--- Wheat
... Rice

The third category listed above is labelled "Political Premium" in setting the base price. Several of the papers from the National Seed Seminar, as well as the APROSC report mentioned this factor. Several of the officials with whom discussion were held also felt that the base price was biased upward by the base price concept of pricing. It was beyond the scope of this consultant to make an adequate assessment of this matter. Detailed price data by district over several time periods would be needed to make an assessment of this "political premium" and it is doubtful that any definite conclusions could be made even with a careful analysis. However, this consultant felt that it should be mentioned again in this report. If the base price is in fact inflated and a policy goal would be to lower seed prices to farmers then the level of price premiums paid to seedsmen may be one place where prices may be cut.

An example of the selling price fixation procedure was presented by B.N. Kayastha at the National Seminar in his paper on Seed Pricing, Subsidy and Related Issues. This table is presented here:-

" SELLING PRICE FIXATION PROCEDURES OF AIC

(Example One Hundred Kilogram of Processed Seed in F.Y. 1980-81)

	<u>Items</u>	<u>Cost in Rs.</u>
1.	Product cost (including premium)	254.16
2.	Transportation charge	4.92
3.	Loading and unloading	0.53
4.	Seed treatment	11.69
5.	Processing and packaging	<u>15.50</u>
	Sub Total	286.80
6.	Shortage or losses (@2%)	<u>5.85</u>
	Sub Total	292.65
7.	Incidental (@ 2%)	5.85
8.	Administration (@ 3%)	<u>8.78</u>
	Sub Total	307.28
9.	Dealer commission (@ 6%)	<u>19.61</u>
	Total	<u>326.89</u> "(p 283,2)

The table reveals that the final seed price includes charges for transportation, loading and unloading, seed treatment, processing and packaging, shortage or losses, incidental, administration and dealer commission.

Discussions with AIC personnel led to the conclusion that these charges were somewhat arbitrary since no detailed system of record keeping was available that one could compute some of these charges. Additionally some of them would vary from year to year thus complicating the matter further. In the example given added charges amounting to approximately 29% of product cost were added by AIC.

The dealer commission of 6% received attention in writings about the seed program and was also discussed with several of the industry personnel. It is felt that the size of this commission may be a limiting factor in the distribution of seed, especially in the hills where sales are scattered and smaller. There is no more economic justification for having one commission rate than there is having one uniform national price for seed.

Given the above discussion and reflecting on conversations with several individuals as well as having had the benefits of the views of several previous consultants it is concluded that some restructuring of the price structure may be in order. The methodology currently being used to arrive at prices given the constraints present in Nepal appears sound. A reordering of the relative importance of the individual components making up the final price of the product I feel would be in order. As an example, if the quality premiums were to be cut by 10% and the dealer commission were to be raised to 10% the end result would

be more interest in selling and lower prices to farmers. Seed growers would not be happy with such a reordering but would probably not stop producing seed since seed production would still be to their advantage over grain production. The numbers given above are obviously arbitrary, however the matter should carefully be considered by industry personnel. The matter of a variable commission somewhat based on cost should also be given careful consideration.

The matter of subsidized transportation from the Terai to the hills is another matter for consideration in seed pricing in Nepal. The effective subsidy of this transportation is equivalent to the difference in production costs between the two areas. One official felt that all seed should be produced in the Terai. It is felt by some that the transportation subsidy shows the privatization of the hill seed industry.

1.2b Mini-Seedhouse Operations

The mini-seedhouse concept is a unique concept in the distribution of seed to isolated farmers. Given the discussions that were held with various officials it is felt that the concept is sound and will result in many remote farmers having access to improved planting materials. An excellent documentation of the experiences of the SPIS project is presented by Bal in Mini-Seedhouse Operation for Hill Seed Production and Supply in Nepal.

Data presented in Table 1 show the collections of wheat to date in the first full year of seed production at all of the sites.

Seed testing data (Reports from STIP) received by SPIS personnel show that the seed is of excellent quality. Most samples were above 95% germination.

Some of these units will be run as private enterprises by seed associations. The SPIS project has subsidized the sites with the building and equipment and supplies to help the association get started. It is felt that some transportation subsidy within the hills would also be beneficial in the establishment of viable organizations. Depending on the success of these beginnings there may be a model developed that can be used for further expansion of the concept. If these prove to be successful the end result will be more involvement of the private sector in the seed industry and improved seed quality for farmers, both goals of HMG/N and USAID (sponsor of the project).

DETAILED WHEAT SEED MULTIPLICATION

Table 1		AREA IN Ha & VARIETY				SPIS/AIC		As of July 1984		REMARKS
		RR 21		UP 262		1983-84				
S/N	SITES	NL 30				NO. OF FARMERS	ESTIMATED COLLECTION M/TON	ACTUAL COLLECTION M/TON	BASE PROCUREMENT PRICE RS/KG	
		TARGET	ACTUAL	TARGET	ACTUAL					
1.	Rampurtar	10	8.00	-	-	70	11.50	4.00	6.17	
2.	Phidim	10	10.00	-	-	34	15.00	13.00	4.00	
3.	Chainpur	10	7.20	-	-	23	11.00	8.00	4.00	
4.	Pakhribas	20	5.00	-	-	8	7.50	3.00	2.94	
5.	Jirikhimti	10	7.50	-	-	25	11.50	3.00	3.92	
6.	Yamkha	10	7.29	-	-	17	11.00	6.00	4.83	
7.	Bhojpur	10	10.00	-	-	22	15.00	19.00	4.65	To be private run
8.	Trishuli	15	15.00	-	-	29	22.50	18.00	3.25	
9.	Charikot	15	8.00	-	-	20	12.00	3.00	*	Private run
10.	Dhadingbesi	6	5.00	1.0	-	5	7.50	3.50	4.75	
11.	Arughat	7	7.00	1.0	1.0	25	12.00	5.00	*	Private run
12.	Sundarbazar	28	28.00	2.0	2.0	85	45.00	16.80	5.00	
13.	Gyandi	13	10.00	2.0	1.4	60	18.00	6.00	3.50	
14.	Galkot	4	4.00	1.0	1.0	27	7.50	1.00	4.00	
15.	Majuwa	14	13.00	3.0	3.0	49	24.00	24.20	4.25	
16.	Bijuar	-	-	5.0	5.0	5	7.50	5.50	2.94	NL 30 variety
17.	Chaurijhari	10	0.75	-	-	1	1.00	1.00	3.19	
18.	Dailekh	10	5.00	-	-	70	7.50	1.00	4.35	
19.	Patan	10	3.00	-	-	9	4.50	-	-	Rain damage
20.	Dipayal	10	1.00	-	-	2	4.50	-	-	Disease Affected(Bunt)
Total		222	154.74	15	13.4	586	256.00	141.00		

* Farmers fix own price.

1.2c Cost and Production Data

As stated elsewhere in the report one of the constraints is insufficient data to adequately assess the problems. Some of the data that follow reached this consultant at the end of the consulting period but it was felt that it should be included so that those following would have access to the information.

Cost of production data were available for one of the areas of the SPIS Project for the 1983-84 wheat for the Chainpur site in Sankhuwasabha district. Their data are shown in Table 2.

Gaudin (IHDP) presented data (Table 3) showing returns to family labor and gross margin returns per hectare for wheat in 1982 (Lekh).

The gross margins of both sets of data show similar returns above costs. Both of these areas are in the hills. The SPIS data showed an average yield of 1357 kg/ha while the IHDP data estimated the yields to be 1380 kg/ha.

Discussions with GTZ personnel revealed that they were working on production cost data, but had nothing published yet. These data were to be available very soon according to GTZ.

In hills costs are represented adequately by these data and if these costs are compared to the prices paid for seed it would seem that seed production would be a desirable alternative for hill farmers.

The data given to this consultant by AIC on collections sales and prices are shown Tables 4-8. Data on collections, and sales and prices paid for seed and prices charged for seed are shown in these tables. Historical data on seed sales by AIC presented in a report presented at the National Seed Seminar is included (Table 9).

Table - 2

1983-84

AVERAGE COST OF WHEAT SEED PRODUCTION BY SPIS PROJECT

SEED GROWERS OF CHAINPUR (SANKHUWASABHA)

No. of farmers - 22
Total area - 156 Ropanis (One ha=20 Ropani)

The production statistics per Ropani, as supplied by the site JT, are as below:

(a) <u>Expenditure</u>	<u>in Rs.</u>
Compost	2.64
Land Preparation	43.83
Seed	40.50
Fertilizer	48.25
Planting	0.62
Rouging	2.45
Irrigation	3.52
Harvesting	9.92
Threshing	7.42
Cleaning & Drying	5.96
Transport	<u>4.71</u>
Total expenditure:	169.82
(b) <u>Income*</u>	
Seed @ Rs. 4/- per kg.	207.47
Grain @ 3.5/- per kg (including rain affected seed not purchased)	<u>58.66</u>
Gross Income	266.13
Net return per Ropani (B-A) (Over direct expenses)	96.31
Net return per hectare	<u>1926.20</u>

*Excluding premium

Table - 3

IHDP
LEKH-WHEAT, 1982

Table to show return to Family
Labour Rs./Hrs. and gross
margin Rs./ha

(Simple Weighted Average)

Pocket Area	Variety	Gross Value of Product	COST RS/HA				Gross Margin Rs/ha	FAMILY LABOUR Rs/ha			Return to Family Labour Rs/Hrs.
			SEED	Com-post	Hired Labour	Total		Direct	Indi-rect	Total	
SAILUNG	IMPROVED RR-21	2939	630	307	254	1191	1748	2248	614	2862	0.59

PRICE

PRODUCT	Rs. 3.12/kg
SEED	Rs. 3.28/kg
COMPOST	Rs. 0.50+1 Hrs Family Labour/Dolo
HIRED LABOUR	Rs. 1.00/HRS

Contd.. Table 3

SUMMARY TABLE

TYPE	TOTAL # OF OBSERVATION	AVERAGE YIELD KG/HA	AVERAGE SEED RATE KG/HA	AVERAGE COMPOST USED DOKO/HA	AVERAGE HUMAN LABOUR HRS/HA	AVERAGE FARM SIZE ROP.	TOTAL OF CHEMICAL FERTILIZER USER	TOTAL OF PEST
INTENSIVE	14	942	192	614	2502	14	-	-
EXTENSIVE	32	990	-	439	-	13	-	-

Yield by village (Home and land Address of the Farmers) and type.

POCKET AREA	PANCHAYAT NAME	VILLAGE NAME	INTENSIVE		EXTENSIVE	
			No.of Cases	Av. yield kg/ha	No.of Cases	Av. yield kg/ha
SAILUNG	SAILUNGESWORI	JHOR	7	1032	20	1011
		MANAGAUN	7	852	12	955

All the Samples were collected from the Bariland just near by the residential houses of the farmers. Hence, yield by Home Address and Land Address are the same as listed above.

Table 4

AGRICULTURE INPUTS CORPORATION
WHEAT SEED COLLECTION RECORDS

S/N	DEVELOPMENT REGION	WHEAT COLLECTED QUANTITY (M. TON)		
		1981-82	1982-83	1983-84
1.	EASTERN DEVELOPMENT REGION	935.000 +400*	2401.000	2785.307
2.	CENTRAL DEVELOPMENT REGION	2436.692 +1200*	2228.000	2340.500
3.	WESTERN DEVELOPMENT REGION	894.500	1590.347	1826.004
4.	MID WESTERN DEVELOPMENT REGION	344.024	499.000	415.540
5.	FAR WESTERN DEVELOPMENT REGION	135.500	144.000	432.340
TOTAL		3745.716 1600.000	6862.347	6899.791
		5345.716		

* SEED COLLECTED FROM FLOUR MILL AS SEED AT THE TIME OF PLANTING

Table 5
PADDY & MAIZE COLLECTION
RECORD*

Offices	Paddy		Maize	
	1892/83	1983-84	1982/83	1983/84
	MT	MT	MT	MT
1. Biratnagar	108.000	292.000	30.000	20.000
2. Janakpur	208.000	101.345	50.000	33.775
3. Bharatpur	155.000	292.000	76.000	190.000
4. Bhairahawa	175.000	133.000		
5. Nepalgunj	44.000	46.000		
6. Birgunj	70.000	-	197.000	122.000
7. Dhangadhi	6.000	21.000		
8. Rajapur	-	35.000		
9. Kathmandu	50.000	13.000		
10. Itahari	36.000	-		
11. Nawalparasi	-	-	-	15.000
Hills	23.000		20.000	33.000
Total	875.000	933.345	373.000	413.775

* Does not include SPIS sites.

Table 6.

AGRICULTURE INPUTS CORPORATION
WHEAT, PADDY, MAIZE SALES RECORDS

S/N	LOCATION (HILLY REGION)	WHEAT SALES QUANTITY (MT)				PADDY SALES QUANTITY (MT)				MAIZE SALES QUANTITY (MT)			
		80-81	81-82	82-83	83-84	80-81	81-82	82-83	83-84	80-81	81-82	82-83	83-84
1.	Dhankuta	9.841	12.290	69.040	5.043	1.360	2.760	0.145		0.332	0.728	0.566	
2.	Ilam	25.950	27.323	47.680	19.720	0.400	1.393	0.910		2.249	3.000	10.840	
3.	Panchthar	8.324	13.430	13.323	20.920	0.161	1.219	1.010		0.304	1.000	1.920	
4.	Terathum	5.530	5.016	17.750	8.072	1.004	0.563	1.123		0.332	0.315	2.254	
5.	Okhaldhunga	9.340	4.770	10.517	9.360	0.175	2.624	0.971		0.295	0.995	9.900	
6.	Diktel	9.753	8.820	13.289	9.326	0.399	0.200	0.052		0.682	0.349	1.304	
7.	Bhojpur	6.433	7.308	24.412	15.804	0.800	0.562	0.258		0.614	1.074	8.444	
8.	Sankhuwasabha	0.491	12.885	26.806	-	0.491	0.745	0.210		1.678	1.488	4.059	
9.	Taplejung	-	-	-	17.000	-	-	-		-	-	-	
10.	Solukhumbu	-	-	-	0.120	-	-	-		-	-	-	
11.	Sindhuli	27.020	10.400	27.960	9.360	5.495	13.600	11.505		1.930	0.740	1.480	
12.	Ramechhap	21.399	14.767	17.240	6.913	5.080	11.790	4.470		6.570	2.100	1.312	
13.	Dolakha	6.968	4.570	0.785	-	-	-	0.050		-	-	-	

Table -6
Contd..

S/N	LOCATION (HILLY REGION)	WHEAT SALES QUANTITY (MT)				PADDY SALES QUANTITY (MT)			MAIZE SALES QUANTITY (MT)		
		80-81	81-82	82-83	83-84	80-81	81-82	82-83	80-81	81-82	82-83
14.	Dhadingbesi	12.950	6.900	6.720	2.190	0.070	0.157	0.305	5.360	1.829	3.531
15.	Gajuri	-	-	3.169	4.840	-	-	0.397	-	-	1.525
16.	Kathmandu	2.822	7.225	17.670	11.690	2.822	4.997	6.997	4.429	8.583	4.330
17.	Hetauda	8.040	9.272	16.240	7.348	2.515	6.201	2.430	13.625	9.628	37.333
18.	Rasuwa	3.652	1.737	3.914	1.332	-	-	-	0.507	0.668	0.616
19.	Trishuli	3.740	3.806	4.740	2.680	-	0.148	0.662	6.154	2.075	2.817
20.	Barhabise	1.840	3.880	2.560	1.520	0.200	-	-	0.340	0.650	1.662
21.	Gorkha	8.110	17.420	38.500	32.190	-	0.458	0.977	1.571	1.502	4.373
22.	Lamjung	31.330	32.441	53.140	--	0.080	1.105	0.370	0.500	0.850	3.008
23.	Tanahu(Damauli)	0.388	35.900	67.676	43.100	0.388	0.280	0.175	0.552	3.970	2.320
24.	Kaski(Pokhara)	2.560	19.520	31.506	12.720	2.560	0.580	71.432	5.854	3.045	4.386
25.	Syanja	17.720	31.905	40.361	22.180	0.185	0.912	0.638	1.720	1.547	4.010
26.	Parbat	8.960	16.340	38.040	19.167	-	-	0.035	0.320	1.240	0.820

Table 6..Contd...

S/N	LOCATION (HILLY REGION)	WHEAT SALES QUANTITY (MT)				PADDY SALES QUANTITY(MT)			MAIZE SALES QUANTITY (MT)		
		80-81	81-82	82-83	83-84	80-81	81-82	82-83	80-81	81-82	82-83
27.	Baglung	14.875	26.182	46.388	11.282	0.075	0.256	0.126	0.293	2.173	1.360
28.	Mustang	15.165	14.040	9.945	3.085	-	-	0.364			
29.	Palpa	3.640	17.480	17.495	-	-	0.035	0.036	0.756	0.720	0.809
30.	Gulmi	22.840	42.822	45.160	40.289	-	-	-	1.620	3.954	6.700
31.	Arghakhanchi	25.549	19.642	36.410	38.680	-	-	-	0.544	2.519	4.930
32.	Manang				11.000						
33.	Myagdi				19.340						
34.	Salyan	6.239	2.385	3.899	0.807	0.085			0.017	0.232	
35.	Musikot	6.194	1.61	0.609	0.924	0.194	0.864		0.039		
36.	Pyuthan	7.816	9.965	26.768	11.230	0.436	0.049		0.420	1.037	0.819
37.	Chaurdhari	0.094		0.991	0.237	0.094		0.035			
38.	Surkhet	0.471	3.792	10.598	1.531	1.744	1.073	1.304	0.091	0.580	0.184
39.	Dailekh	0.245	0.475	1.990	0.998	-	0.170	1.598		0.337	
40.	Jumla	2.755	1.465	6.037	4.009	-	0.139	0.028		0.104	

Table 6..Contd..

S/N	LOCATION (HILLY REGION)	WHEAT SALES QUANTITY (MT)				PADDY SALES QUANTITY (MT)			MAIZE SALES QUANTITY (MT)		
		80-81	81-82	82-83	83-84	80-81	81-82	82-83	80-81	81-82	82-83
41	Rolpa			9.219							
42.	Mugu				3.300						
43.	Dolpa				2.800						
44.	Doti(Siliguri)	3.750	9.192			4.599	2.486				
45.	Bajhang	14.369	2.445	0.043			0.136		0.059	1.130	
46.	Dadeldhura	0.716	0.813	4.830	14.180	0.285	0.322	0.067	0.073	0.772	0.101
47.	Baitadi	1.725	1.395	30.150	2.400	-	0.895	6.056		0.005	0.004
48.	Darchula	0.051	0.107	4.892	9.850	-	0.038	0.005		0.027	0.106
49.	Bajura				2.600						
50.	Dipayal			5.758				5.758			0.252

Table 6.....Contd..

S/N	LOCATION Tarai Region	WHEAT SALES QUANTITY (MT)				PADDY SALES QUANTITY (MT)			MAIZE SALES QUANTITY (MT)		
		80-81	81-82	82-83	83-84	80-81	81-82	82-83	80-81	81-82	82-83
1.	Bhadrapur	37.900	16.995	133.767	50.000	11.007	14.905	27.487	4.801	1.967	6.432
2.	Damak	41.000	48.322	103.864	108.088	5.080	16.854	20.406	4.840	0.440	4.961
3.	Biratnagar	233.064	206.369	572.079	305.120	9.787	21.260	34.579	9.171	14.144	5.348
4.	Itahari	169.224	206.806	481.828	230.000	10.740	10.352	16.815	5.433	1.003	5.621
5.	Rajbiraj	37.875	77.909	225.112	56.421	1.410	5.630	37.538	0.408	0.520	5.248
6.	Siraha	3.340	10.575	117.684	1.120	0.807	0.615	4.857	0.118	-	2.374
7.	Lahan	7.360	20.733	130.162	6.380	0.580	1.640	7.413	0.480	0.360	1.749
8.	Udaypur	10.976	6.272	12.849	7.225	0.316	2.256	2.224	1.510	0.667	4.072
9.	Janakpur	79.439	120.942	373.915	45.009	5.402	9.129	112.292	0.888	3.595	44.458
10.	Sarlahi	50.889	44.161	118.890	9.800	7.612	6.775	21.400	0.807	5.114	3.310
11.	Birgunj	146.070	424.190	411.260	170.480	33.000	24.443	54.634	8.000	12.018	33.275
12.	Gaur	16.831	17.968	50.395	7,775	7.942	-	10.699			
13.	Chandraniga- hapur				18.880			3.517			5.285

Table 6 Contd...

S/N	LOCATION Tarai Region	WHEAT SALES QUANTITY (MT)				PADDY SALES QUANTITY (MT)			MAIZE SALES QUANTITY (MT)		
		80-81	81-82	82-83	83-84	80-81	81-82	82-83	80-81	81-82	82-83
14.	Bharatpur	93.800	122.760	197.538	208.920	0.053	8.510	25.847	3.306	15.820	20.760
15.	Bhairhawa	46.892	95.685	259.802	84.000	49.646	19.663	144.945	1.951	5.182	2.865
16.	Taulihawa	2.468	14.101	33.862	17.592	2.949	6.951	8.776	0.073	0.412	0.735
17.	Krishnanagar	8.030	21.832	40.370	23.727	1.835	6.451	4.716	0.068	0.205	0.741
18.	Nawalparasi	45.640	108.400	151.390	118.940	4.610	11.267	5.321	0.479	4.423	2.711
19.	Dang Ghorahi	4.135	1.700	58.063	40.000	1.505	0.845	1.717	0.295	0.950	1.371
20.	Tulsipur	1.970	17.265	33.480	13.510		0.048	1.051		0.300	0.531
21.	Banke (Nepalgunj)	12.336	34.082	56.653	24.430	4.894	6.093	28.655	0.475	4.263	2.953
22.	Gularia	21.406	31.427	63.302	24.341	4.355	6.510	6.580	0.280	2.360	1.096
23.	Rajapur	16.110	26.103	47.210	53.330	1.750	3.969	1.614	0.070	0.338	0.840
24.	Dhangadhi	3.935	31.488	70.737	52.000	1.760	2.668	11.774	0.311	0.446	1.651
25.	Mahendranagar	9.252	27.820	59.122	20.460	6.430	0.275	10.506	0.335	0.328	0.400

Table - 7

Wheat Seed Purchasing Price

Location	Purchasing Price/QT	
	1982/83	1983/84
Jhapa	325.00	302.50
Biratnagar	400.00	302.50
Janakpur	343.27	319.00
Birgunj	345.00	333.50
Rajbiraj	326.00	285.00
Bharatpur	345.00	302.50
Bhairahawa	354.00	
Parasi	345.00	302.50
Nepalgunj	282.50	
Gularia	280.00	202.50
Gulmi Tamghas		425.00
Dhankuta		294.00
Chainpur		400.00
Phidim		400.00
Jirikhimti		392.00
Yamkha		483.00
Bhojpur		465.00
Trishuli		325.00
Baglung		400.00
Gulmi		445.00
Pyuthan		294.00
Diktel		483.00

Contd... Table 7

Location	Purchasing Price/QT	
	1982/83	1983/84
Dhadingbesi	345.00	475.20
Pokhara	330.00	
Damauli	320.00	350.00
Tulsipur	300.00	
Dhangadhi	275.00	
Damak	325.00	
Rajbiraj	326.00	285.00
Bhadrapur	325.00	
Mahendranagar		311.00

Table - 8

Wheat Seed Selling Price for Fiscal Year
1983/84, (040/41)

<u>Location</u>	<u>Selling Price/QT</u>
Pokhara	532.20
Syanja	743.68
Sindhuli	399.70
Baglung	661.46
Damauli	518.45
Charikot	532.00
Lamjung	856.00
Rajapur	532.20
Janakpur	681.85
Dang	515.46
Tulsipur	515.46
Mahendranagar	681.85
Biratnagar	674.87
Nepalgunj	595.79
Gularia	454.28
Hetauda	667.11
Rautahat	681.85
Itahari	667.20
Bhairahawa	642.82
Rajbiraj	675.00

Table - 9

SALES OF SEEDS BY AIC

m.t.

Year	Quantity of Seed Sold			
	Vegetables	Paddy	Maize	Wheat
1965-66	-	-	-	-
1966-67	-	140	-	161
1967-68	-	231	30	508
1968-69	-	253	49	426
1969-70	-	210	40	411
1970-71	-	102	47	326
1971-72	-	265	56	814
1972-73	-	163	50	1873
1973-74	-	414	46	1366
1974-75	-	328	51	1555
1975-76	-	184	145	1727
1976-77	3.7	359	105	1811
1977-78	4.8	300	145	2098
1978-79	5.3	256	93	2073
1979-80	5.0	306	149	2470
1980-81	7.8	204	104	1516
1981-82	8.5	243	134	2217

Source: Seed Program Development Strategy: Upadhayaya (p 262, 2)

2.0 Seed Quality and Seed Subsidy in Nepal

2.1 Seed Quality

One of the major problems faced by any seed industry is quality. It is also a major problem in Nepal. It is well documented that after physiological maturity in the field all that can happen to seed is detrimental to quality. All that can be hoped for is quality maintenance.

Farmers are also aware of quality and will be hesitant to purchase seed where they have a question of quality. Substantance farmers are even more quality minded since the risks of crop failure due to poor seed are extremely high.

In Nepal maintaining good seed poses many problems. There are problems at all levels in the marketing channels from the seed farmer through the system back to the user. In fact, in the case of corn there is often a major problem arising in that proper drying cannot be accomplished due to the rains during the harvest season.

Lack of adequate facilities for quality maintainence and a lack of understanding from handlers that seed are live and need to be kept live are major sources of quality problems.

The specifics of some of the problems in storage, transportation (porter, etc) are well known and well documented elsewhere and will not be dwelled on in this report. Many advances in the construction of storage facilities and training have been made over the past several years, however much remains to be done.

This consultant agrees with the recommendation of former consultant Dr. J.E. Douglas when he states "This report recommends that the AIC seed programme take immediate steps to improve its management of seed stores and institute an internal quality control programme with a seed quality control officer". It is understood that STIP plays a major role in the area of quality control; however, they alone cannot and should not be expected to serve the needs of AIC in quality control. Needs for both equipment and personnel should be carefully analysed and an all out effort to provide these are a must for the future of the seed programme.

An example of the problems faced by AIC in the hills is illustrated below. One of the goals is that the hills be self sufficient in seed production. This would both lower transport subsidies and increase quality of seed provided hill farmers. Many of the quality problems discussed were due to problem encountered in moving seed from the Terai to farmers in the hills.

Data provided by AIC personnel with respect to the SPIS hill seed multiplication program reveal that 586 farmers were contracted to provide an estimated 256 MT of wheat seed for the 1983-84 season (Table 1). With these figures it can be easily seen that a system of quality control needs to receive utmost attention from AIC.

Thus far actual collections from the estimated 256 tons have been 141 tons. More is expected to be collected.

The results of SPIS hill seed production in its first full year are an excellent beginning. Personnel working with the project feel that the seed produced in the project are of a high quality (Discussion with Mr. Bhagwat Shrestha). Samples returned to SPIS from STIP showed that most of the samples germinated above 95%. The sale price for the 1983-84 wheat seed has not been established at this time.

This consultant has what he calls a "Restaurant Theory" concerning seed quality that sums up the importance of good seed. Very simply the theory is that farmers are about seed the way most people are about restaurants. If you go to a place and get high quality food with excellent service you will probably return even if the price were a little higher than you thought it should be. However, if you go to a place and are disappointed you will be hesitant to return regardless of the price. If you do return and are disappointed a second time it will probably be your last trip unless you hear that drastic changes have been made.

From discussions with many people I feel that many people have been disappointed the first time often through no fault of AIC personnel. It is felt that it is time to begin to make some of the changes in addition to the ones already in progress.

Discussions with some of the personnel revealed that one of the considerations being discussed is that AIC change its operations such that only certified seed are handled. Since certified seed are normally subject to higher quality control standards that this is a goal worth pursuing. However, if AIC deals only with certified seed, there should not be a temptation to certify everything AIC has. Seed not meeting the standards should be disposed of as grain. Careful consideration to providing the needs of farmers needs to be given, however a systematic move in this direction is recommended. It is felt that a strong internal quality control program and the standards of STIP would help AIC to provide a higher quality seed.

Current storage facilities of AIC need to be carefully studied to see what modifications need to be made to improve the facilities so that quality will be better maintained. It is suggested that a list of needs to improve current godowns be compiled by the AIC seed division and that these needs be given attention. It is possible that improvement of current facilities could be included in a future project with USAID or some other donor.

2.2 Seed Subsidy

In Nepal the seed industry is subsidized in several ways. Some of these are direct and easily quantifiable others are indirect and could be classified in other manners. Examples of some of these subsidies are:

1. Inputs from outside donors USAID, GTZ, FAO, Japan, Peace Corps etc.
2. AIC seed division (not a money making organization)
 - a. Personnel
 - b. Seed Plants
 - c. Transportation
3. the STIP
4. Research Farms and Foundation Seed Programs
5. DOA storage houses and extension agents.

The above list is not all inclusive, however each of these units and, I am sure, some others make contributions to Nepal's seed industry. Even if the "improved seed" industry distribution system were to enter the private sector most of the above listed institutions would remain as viable contributors to the industry.

Discussions with several officials revealed that guidelines for the Seventh Five Year Plan reveal an interest on the part of HMG/N to reduce subsidies.

The major target for the seed industry as this consultant sees is the specific subsidy on transportation. It is felt by some that a reduction in this area would help the private sector to further develop.

Before specifically commenting on the worthiness of this goal a few comments on the general nature should be addressed. One of the major economic justifications for a subsidized seed program is the transfer of technology resulting in increased use of high quality seed that would result from this subsidy. If in fact the result of a program are such that there is increased production from using high quality seeds and the returns of the increased production are greater than the cost of the project then the expenditure on the project can be justified. Analysis has shown over and over that the social returns to a seed project are very sound from an economic viewpoint. However, analysis has also shown that the "players" in a seed enterprise often do not get enough returns to encourage participation of private firms. Most of the returns resulting from high quality seed use go directly to the farmer and not the seedsman. In the case of hybrid seed and specialized seed (vegetable, etc) enough returns can be held by the private concerns to economically justify private industry participation.

More specifically if as a result of decrease in transportation subsidies the end result would be lower usage of HYV seeds the savings from the reduction in costs could be more than offset by the value reduced production at the farm level that would have taken place at a higher subsidy. Policy makers will have to make this assessment by comparing the anticipated tradeoffs.

Relevant questions to be considered are:

1. How much reduced flow of improved seed to farmers would result if the subsidy were removed ?
2. What is the marginal value of products derived from having this subsidy ?

3. If less food is produced as a result of lower uses of HYV seeds due to cuts in transportation subsidies how will this effect the already food deficit hill area ? What will be the cost of transporting added food versus transporting seed from the Terai ?
4. Can HMG continue to subsidize the seed industry given budget constraints ?

If an assessment leads one to the conclusion that the increase in the value of production is less than the cost of the subsidy the solution is obvious; if not subsidies may be justified for the short run (if HMG/N can afford the subsidy in the short run)

As may be the case in Nepal and with many other under-developed areas of the world, farmers are not convinced of the value of seed and changing their mind may be a long run proposition. If the case in Nepal is such that farmers are aware of the value of high quality seed and they would purchase the seed without the subsidy then again the solution is obvious. It is not obvious to this consultant in this short time frame just where the farmers of Nepal lie. It may be that there are elements of both situations in the country. If this is the scenerio then HMG may want to follow a dual policy for different areas of the country. For example, there may be a strong justification to highly subsidize a seed program in the hills to get seed of improved varieties used, whereas farmers in other areas of the country have already been made aware of the value of high quality seed, and are already using them.

A specific case where subsidies were discussed was the subsidy on 100% of transportation costs from the Terai to the AIC district office in the hills by HMG. Private individuals feel that this subsidy has a direct effect of holding back the development of a hill seed industry. It is this consultant's understanding that there is no subsidy on transportation beyond the district office. Thus, the effective subsidy is not the transportation costs but the difference in production costs between the hill and Terai. There is the feeling by some that transportation subsidies in the hills could be used to help establish the industry there. Data are not available to critically assess this matter but the matter should be given careful consideration in planning. If the subsidy is removed relevant questions to ask would be "Would seed be available in the hills without the transportation subsidies? What is the value to farmers of having the seed? Would the current food shortage in the hills be larger as a result of reduced supplies of improved seed?"

Transport subsidies within the districts in the hills would help to improve the use of seed in the area. If privatized mini-seedhouses received some transportation subsidies they could also be more apt to succeed.

The IHDP project subsidizes internal transport of seed and has found this policy to be helpful. On a national or total hill basis the cost of such a subsidy would have to be carefully considered.

The above questions are questions of HMG/N policy goals and have broader implications than the savings on transportation.

With the advent of SPIS and other programs in the hill section seed production of HYV seed has begun on a formalized basis. (Specifics appear elsewhere in this report and in greater detail in other documents). This is a noble venture in that it will reduce the amount of transportation subsidy needed in the long run and probably more importantly it will eliminate some of the quality problems that have plagued the seed distribution system due to the long transportation time required. In addition the seed will be available to farmers on a more timely basis (another major problem for AIC distribution system).

3.0 Analysis of Pricing System

3.1 Short run effects of current pricing system

The present pricing system encourages production of seed by farmers for sale to AIC. The base price concept based on an attractive price and quality premiums both encourage seed production. If the "political premium" (discussed in another section) is actually part of the pricing system it also encourages production of seed for sale to AIC. This system leads to high procurement costs.

The costs associated with conditioning and distribution added to the procurement cost, even though AIC do not include all costs associated with getting seed to the user, results in a relatively high cost of seed to farmers. The final seed price probably has the overall effect of limiting seed sales.

Quality of the final product in reality also plays a major role in the sale of seed and cannot be separated when discussing price. Review of literature and discussions with individuals revealed that AIC seed has often been of poor quality.

Often the quality problem results from improper storage and handling of seed not within proper management control of the seed division. The interplay of these factors makes it very difficult to make an adequate assessment of the pricing system.

It is felt that the separate pricing of individual lots of seed of the same variety of seed (often of similar quality) can cause confusion among purchasers. A system may be evolved whereby differential pricing of certified and improved seed is adopted. But the prices of a particular variety in a given location should be the same if the procured seed is of a quality to be labeled as seed.

The commission of six percent throughout the country I feel may hinder the sale of seed especially in the hills where the quantity purchased for seed is low. This results from the small land holdings of farmers.

During the recent past prices have been lowered during the season. While it encourages sales (some portion going as grain) it has the effect of ill will among farmers who purchased seed early in the season. This type of short run solution may cause long run problems. It is a sound business practice to sell excess untreated production at reduced prices after the planting season, however changing prices in midseason may result in farmers waiting to purchase seed until the last minute in hopes that AIC will reduce prices.

The current pricing system both encourages and discourages private ventures. While the system results in high price (compared to grain price) to farmers it encourages individuals to sell seed since there is a relatively high margin for private individuals who wish to compete with AIC. Private enterprise will be encouraged

to develop in areas where AIC seed price is known but AIC seed is not in close proximity to the area where a private venture is contemplated. An example of this is the Arughat site of SPIS. The current system discourages private enterprise in that the current scheme provides a high price for seed with no risk to the producer. It is easier for a farmer to sell his seed to AIC at harvest and receive a high return (high price base plus premiums) with no risk than to sell to other farmers after having stored seed for several months and running the risk of not selling all his seed or having his seed deteriorate.

While this consultant feels that the pricing methodology is reasonable given the current situation it is felt that a restructuring of the premiums and sales commission could result in greater sales to farmers by lowering the price of seed and raising the commission rate (where it is deemed low) without losing producers. The current system in my opinion has a bias toward the seed producer which discourages sales to farmers and discourages private venture in most cases.

In principle, the current system should result in AIC being able to insure quality of seed being produced since seed production is an attractive alternative to farmers. This being so, AIC must be more selective of producers. The current distribution system (seed farmer to farm) has some problems with quality maintenance that need to be addressed. A strong internal quality control program needs to be instituted so that all of the factors discussed above could be based on an analysis of the pricing system for quality seed.

In the current system of prices many of the cost elements are arbitrarily assigned. AIC does not have a record keeping system in place that would allow one to adequately address some of the problems due to pricing. Much data is gathered

but some attention should be given to instituting a formalized system of record keeping and reporting that would provide the type of information for sound decision making. Data on costs of operation of the various units, quality control records, costs of supervision, etc. should be maintained such that it is possible to pinpoint problems and determine whether they arise from the pricing system or the quality of seed (or both).

3.2 Long run effects of the current pricing system

The long run effects of the current system are that the seed program will move slower than it could otherwise. Private enterprise will develop slowly if the current system is maintained. However, private enterprise in self pollinated crops will probably develop slowly under any pricing system that would not be subsidized by the government.

In the longrun the system of paying high premium to farmers will have the effect of insuring higher quality seed being produced at the farm since seed production would be the farmers best alternative. AIC with these high premium could be more selective of producers because of these incentives.

Having different prices for seed lots at the same store in the long run is not advisable. If seed is worthy of a specific classification like varieties of like kinds of seed it should be priced the same at each outlet. Different prices can cause confusion and raise questions among individual farmers who may not have a full appreciation for why individual lots of like varieties are priced differently.

While changing prices during the season results in moving greater quantities of product in the short run the long run effect of such a policy will be negative. A farmer will try to wait for the price drop or be mad at AIC (even though he was treated fairly) because he paid more for the same seed than his neighbor.

If high price is the drawback to sales and added sales are a goal along with high prices to seed producers to insure quality production then the seed industry will have to be subsidized to a greater extent. This would probably be a sounder policy than changing prices in mid year and losing the confidence of customers.

The long run effects of the current record keeping system are bad. Without adequate records and reports decisions will continue to be made "by the seat of the pants" or based on political reasons rather than sound judgement. Records on both financial and quality control would provide the seed division a better basis for internal control as well as providing superiors sound decision making criteria to make needed changes. Much of the data is currently being gathered and personnel are aware of the need for an improved system. Some attention should be given to the establishment of a more formalized system since it will be imperative for the program in the long run.

4. Policy Options

4.1 Continue Current Policy

There are several policy options available to Nepal's seed industry. The first option is to remain on the current course. The current pricing policy is one whereby production of seed is stimulated due to relatively high prices paid to farmers. Drawbacks of the current policy are in the marketing and consumption areas. These are pointed out above.

4.2 Modify Current Policy

4.2a Option 1

As stated above the basic methodology of the current policy is sound. A restructuring of the policy by changing the rates of premiums to farmers, commissions to marketers (private or Sajha) and prices to farmers appears desirable.

In an example stated above it may be possible to lower premiums to seed farmers without losing them as producers while at the same time increasing commissions to persons selling AIC seed and have lower prices to farmers. Example, reduce premium by 10% increase commission 5% and lower price to farmers by 5%. It should be noted that these numbers are arbitrary and would have to be carefully studied. Under the existing system farmers are not paying the full cost of seed therefore some subsidies will remain to encourage seed use.

4.2b Option 2

Another modification that would have the effect of maintaining production, encourage marketing and farmer use of seed would be to increase the subsidy levels of HMG/N.

Under this situation industry personnel would lower prices to farmers (they should not be lowered to or below grain prices) and maintain the high prices to producers. For example, set the price seed sold to farmers at some percentage above grain price at planting time (10,20,30,50, ?) but lower than current method prices seed. This would stimulate consumption. At the same time the commission rates may or may not have to be altered. Increases in commissions in line with the size of commission per sale has some merit. Increased sales would result in larger returns to the people in the marketing channel. This option has the problem of increased government subsidies and a dampening effect on encouraging private dealers.

4.3 Have separate policies for Terai and Hills

Since the two areas have distinct sets of problems one option would be to have separate policies for each area.

Under SPIS the goal to privatise the mini-seedhouses appears sound. The logistical problems of travel in the hills along with smaller sized farms dramatically increase management problems as well as quality problems if seed are to be transported from the Terai.

Discussions with officials lead me to believe that without close supervision or a subsidized private (seed associations, etc.) enterprise many of the mini-seedhouses will not continue to operate. AIC would be the best organization for HMG to use to issue these subsidies so that there would be some continuity in the program. The remoteness of these areas is one reason for this suggestion.

The subsidies in the hill section could take several avenues. Facilities, equipment, supplies, price support (AIC will buy extra seed to deliver to other hill areas), reduced price foundation seed, etc., are some of the means that could be used to help the hill seed industry develop without adding much more work to the AIC seed division.

Given that there are some current examples that are having some degree of success in the hills these may serve as models. Privatization of the seed industry could allow for the potential for seed to be sold with some barter system that could increase the use of improved seed. Farmers have very limited cash income which serves as a constraint to seed sale under the current system.

Subsidizing the metal bins for remote areas is one means of helping hill farmers that needs to be pursued. Due to the time of this consultancy I was not able to give the specific concept much thought, however it is felt that the matter has some merit as a means of helping expand the seed industry in the hills.

4.4 AIC only handle Certified Seed

A policy that AIC only handle certified seed is a long range goal that has merit. If only certified seed were handled I feel that it would result in a higher quality seed being produced and an improved image for AIC Seed.

A policy of handling only certified seed would remove the problems of seed being "politically grown". Records are such that it is not easy to tell what this would entail. Also there would have to be a commitment on the part of HMG to strengthen the foundation seed program and the seed certification program if the needs of the farmer are to continue to be met.

4.5 General Observations

All of the above policies will not be successful if seed quality is not given a very high priority. AIC should establish an internal quality control system beginning with a system of records where they can easily spot quality problems. Equipment should also be made available so that AIC could do some testing internally.

A commitment to strengthen the seed certification division and foundation seed program to allow for timely field inspections, timely return of laboratory reports, and sources of high quality foundation seed are prerequisites to much improvement in the total program.

A continued and improved effort to find new HYV that are adaptable to Nepal's conditions could pay high dividends. The improved varieties of wheat and corn are fairly widespread and are mostly the same varieties that have been available for years. There is no economic justification for spending critical cash for a product that is already available.

Current facilities of AIC need to be improved so that seed can be stored properly. In many cases I am told that vast improvements could be made with only minor modifications of current space. For example in some godowns the only modification needed may be a ^{new} wall.

In some cases metal bins could be provided to local AIC offices to help preserve seed quality. AIC needs to make a critical evaluation of its current facilities and make this information available to donors who plan to aid and improve the seed industry in Nepal.

Training of personnel should remain a high priority if the program is to continue to improve. It is this consultants

observation that there have been vast improvements in the overall program since his last visit in 1977. However, as with all things much work needs to be done and building upon the current institutions with more trained people is a must in any future programs. HMG and donors are to be commended on their commitment to training which has been evident.

Random Comments From Meetings

Throughout meetings with individuals there were comments that may need some investigation. Due to the limited time of this consultancy they could not be pursued. These are presented for discussion only and some of them are personal biases of individuals. No attempt is made to document the person making the comment and the comments are not arranged in order of importance.

1. Administrators are at times not sensitive to the needs of the seed division.
2. Foundation seed production has a low priority and needs to be improved.
3. AIC at times rejects fields when rejection is not warranted on technical grounds.
4. Field personnel don't care about seed.
5. Reports take too long to come back from STIP for no reason.
6. The current warehouse facilities within AIC and Sajha offices lead to quality problems.
7. Seed pricing policies are subject to political pressure.
8. Production at the expense of quality is often directed by administrative decree.
9. Prices are too high to farmers.
10. AIC could develop an export market for vegetable seeds.
11. The Indian market has a large effect on Nepal's prices.
12. Improper drying is a major quality problem for corn seed that needs to be addressed.
13. Seed often have to be downgraded because DOA personnel could not make timely inspections.

14. A bottom up system of prices needs to be established starting with the farmer rather than starting with the seed producer.
15. It is more important to be available for administrative consultation than to be in the field where needed.
16. Rates porters receive for carrying other commodities often results in delays of seed deliveries.
17. A system where barter could be a means of seed purchase would aid seed sales.

Officials met by the Consultant (in Kathmandu)

<u>Date</u>	<u>Name, Position & Address</u>
16 July 1984	Mr. S.S. Bal, Project Supervisor Seed Production & Input Storage Project.
	Mr. B.B. Sijapati, Economist Agricultural Project Service Centre
	Dr. J.R. Baral, Executive Director Agricultural Project Service Centre
17 July	Mr. C.T. Hash, Chief ARC, USAID/N
	Mr. B.P. Parajuli, Chief Seed Division, AIC
	Mr. C.M. Manandhar, Project Coordinator Seed Production & Input Storage Project
	Mr. C.D. Acharya, Sr. Agri. Officer Agriculture Inputs Corporation
	Mr. D.K. Karki, Agri. Officer Agriculture Inputs Corporation
	Dr. C.N. Hittle, Project Supervisor Integrated Cereals Project
	Mr. N.B. Shrestha, Asst. General Manager, Agriculture Inputs Corporation
	Mr. A.M. Tamrakar, Chief, Planning Division, AIC
Mr. R.B. Singh, Joint Secretary Ministry of Agriculture.	

<u>Date</u>	<u>Name, Position & Address</u>
18 July	Mr. W.P. Novero, Fertilizer Distribution & Training Specialist Food and Agriculture Organization.
	Dr. W. Rothhaar, Project Manager, Cereal Seed Project (GTZ)
19 July	Mr. A.M. Pradhananga, DDG Department of Agriculture.
	Mr. B.D. Parajuli, Chief Marketing Division, AIC.
	Mr. R.P. Singh, Sr. Officer, Marketing Division, AIC.
20 July	Dr. P.R. Mathema, Director-General Department of Food Agriculture and Marketing Services.
23 July	Mr. Paul Morris, Economist USAID/N.
	Mr. Bhagwat Shrestha, Seed Technologist Seed Production & Input Storage Project.
24 July	Mr. P.N. Rana, Act. Secretary Ministry of Agriculture.
	Mr. R.N. Iltis, Field Supervisor Seed Production & Input Storage Project.
	Dr. B.N. Kayastha, Former Project Coordinator, SPIS Project.
25 July	Ms. Jayne Dalager, PCV Seed Production & Input Storage Project SPIS Mini-Seedhouse, Rampurta.

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13. Rekhi, S.S. "Vegetable Seed Production Status and Future Scope in Nepal".
14. Rijal, B.P. "Seed Multiplication Problems and Solutions".
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ANNEX A

Table of Contents and Executive Summary
from the
Document on National Seed Program
and
Consultancy Report
by
Dr. J.E. Douglas

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EXECUTIVE SUMMARY

The report has three main aspects:

- (1) A documentation of the present National Seed Programme of Nepal.
- (2) A consolidated list of the recommendations from the National Seed Seminar, February 1983.
- (3) Comments and suggestions regarding the recommendations concerning the future improvement needed in the National Seed Programme.

This executive summary will synthesize these points into a single listing of major suggestions and recommendations.

I. Background:

- A. From the beginning of a more systematic development of the seed programme in the early 1960s until today considerable progress has been made. Many of the components needed to develop a successful programme exist.
- B. Seed is a catalyst for agricultural development and higher crop yields. If production is to increase, more good seed of the best varieties must become available to the farmers of Nepal.
- C. National leaders need to carefully examine what now exists in the National Seed Programme and take actions necessary to develop the present programme into a highly effective mechanism for delivering seed to the farmers.

II. The National Seed Programme rests upon the results of crop research.

- A. The significant advantage in yield, earliness and disease resistance now being demonstrated by the new maize, rice and wheat varieties indicates meaningful advances are possible in total crop production. Similar improvements are being identified from the testing and evaluation of vegetable, grain legume and oilseed varieties. The potential for increased production is much greater than nine years ago because of the improved germplasm with research programmes.
- B. A much more dynamic and farmer responsive seed production and supply system plus increased fertilizer use is necessary if the benefits of these research results are going to spread to farmers rapidly.
- C. Favourable market prices from the farmers point of view will also greatly further stimulate production and the use of improved seed and fertilizers.

III. Organization and coordination of the National Seed Programme

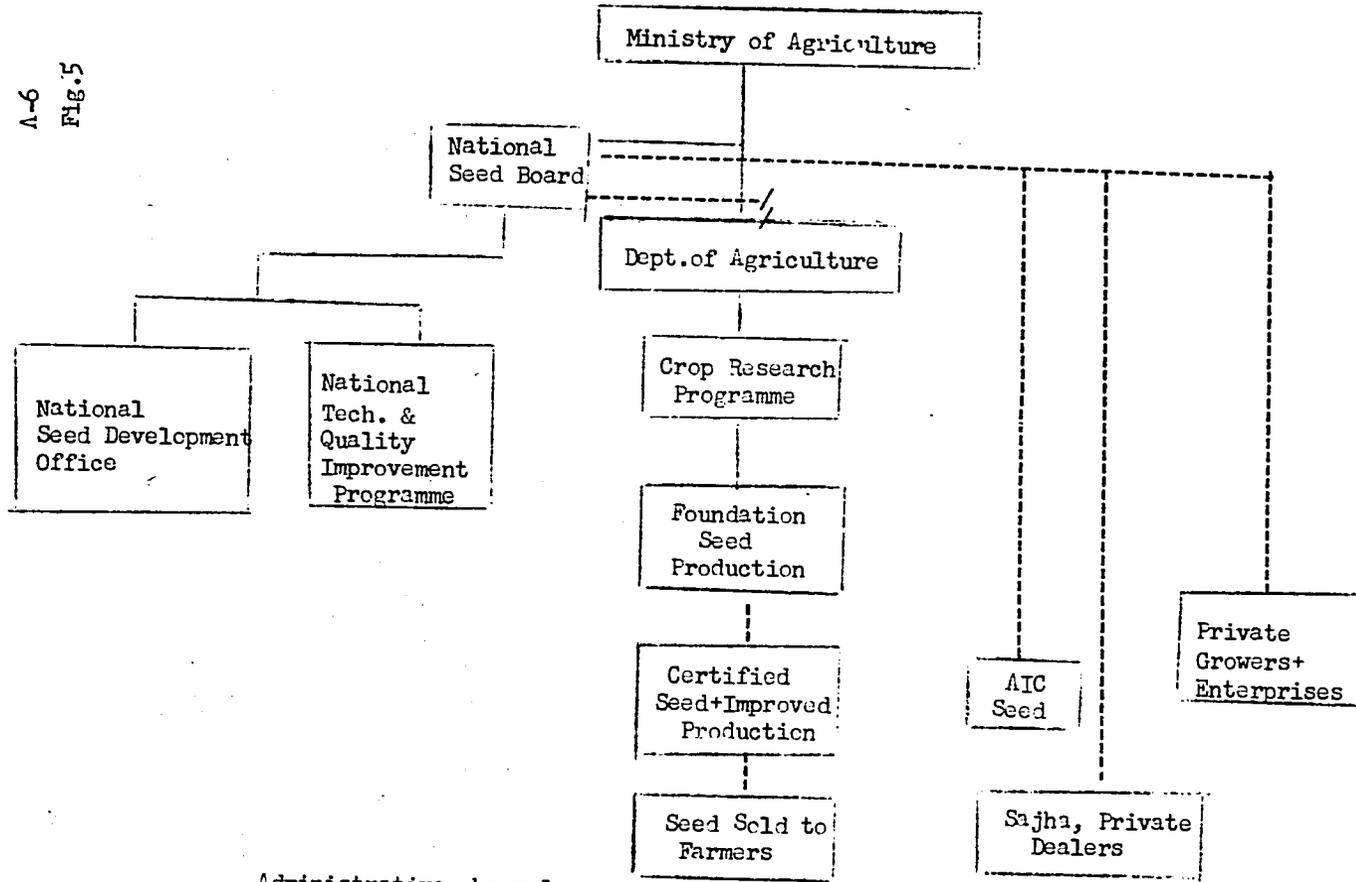
- A. Although many of the components of a seed programme exist, the programme lacks a focal point and an effective coordinating mechanism to achieve the maximum benefits desired. The Seed Seminars recommendation that a National Seed Board be formed to overcome this weakness is supported. In addition it is recommended that a National Seed Development Office be established to assist the Board in achieving its objectives. It is suggested that the

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National Seed Development Office have three officers attached to it - (1) Seed Planning and Development (2) Coordinator of Foundation Seed and, (3) Seed Training and Information.

- B. It is recommended that the present Seed Technology and Improvement Programme which is in the Agricultural Botany Division be made responsible to the National Seed Board. The programme could be renamed to "Seed Technology and Quality Improvement Programme" and the present three activities made into clear sections including seed certification, seed testing and seed research. Fig.1 illustrates the concept of a National Seed Board in relation to other components of the National Seed Programme.

A-6
Fig.5



————— Administrative channel
----- Links to the Board

IV. Initial seed increases:

- A. The initial seed increases -Breeder and Foundation - are all done at research stations and other government farms. With the establishment of seed conditioning equipment and the maize, rice wheat and vegetable stations the physical capability exists to produce good quality seed. The Seed seminar recommended that a Coordinator of Foundation Seed be named to help overcome weaknesses in the present programme. This proposal is good and can help strengthen this part of the programme. However, it is also recommended that each concerned station also have a Breeder and Foundation Seed Production Specialist. A technician with mechanical aptitude must also be identified and trained to operate the equipment at each location.
- B. The Jhumka farm in the Eastern Region should also be included for Foundation Seed Production if the need exists. Foundation Seed may be produced on other government farms but they would not be administratively under the Coordinator of Foundation Seed as would be the case of Jhumka farm. It would be better to concentrate production around the present main stations and contract with farmers for some production rather than to make sizeable investments in new Foundation Seed Farms.
- V. Production, drying, conditioning and marketing of certified and improved seed:
- A. The Agricultural Inputs Corporation (AIC) is the dominant organization producing, conditioning and storing certified and improved cereal seed in the official sector. The Seed Division is directly responsible for this work. The

distribution of seed to farmers is done largely through cooperative societies. Vegetable, grain legume, and oilseed are handled through government farms and special projects. Very limited quantities of pasture and forestry tree seeds are produced through official programmes.

- B. The Seed seminar recommended that a careful review be made of the AIC seed activities with a view to determine how they could be strengthened and proposed that the formation of some kind of autonomous Seed Corporation be considered. The Seminar also put considerable stress on the need to develop the private sector to carry more responsibility in these activities.
- C. This report recommends that the AIC Seed Programme take immediate steps to improve its management of seed stores and institute an internal quality control programme with a seed quality control officer. In addition greater assistance on seed quality is suggested from the Seed Technology Improvement Programme at Khumaltar. It is also recommended that the Seed Division have a separate section concerned with development and the Hill Seed Project.
- D. In the long-term alternatives are outlined for a stronger seed production and supply programme. If the private sector is to be encouraged, it is suggested that the alternative of a large National Seed Corporation would work against this objective unless policy changes are made in allocating Foundation Seed, Seed pricing and seed distribution procedures. Instead two alternatives are suggested. One would be a National Seed Corporation with the shares jointly held by the government and the seed growers with policy changes. The other and preferred alternative is a smaller seed corporation with limited objectives and a decentralized production and supply system. The existing conditioning

and storage facilities of AIC could be used to provide custom service for developing independent seed grower-sellers and "mini seed enterprises". In some cases the facilities could be sold or leased to seed grower groups in the area.

- E. The present pricing and subsidy policies work against the development of farmer-grower-seller or seed enterprises. It is recommended that the maximum premium of 30% to seed growers be reduced to 20% and that the 10% saved be added to the seed selling commission or a commission of approximately 15% be offered for selling seed. This kind of change would encourage more individuals and groups to sell seed. It is recommended that the proposed National Seed Board carefully weigh this issue and its impact on the long-term development of the total seed programme and industry.
- F. Seed prices should always be above local grain prices in the case of cereals. Since market prices vary from area to area a sub-regional pricing pattern seems appropriate.
- G. Since these issues are complex and affect more than the AIC, it is recommended that the proposed National Seed Board or a high level committee appointed by the Ministry of Agriculture review these alternatives and establish national guidelines for future development of the private and public sector in seed production and supply.
- H. Considerable potential exists for vegetable seed production. A ten-year development programme is needed to help the nation, through the combined efforts of the public and private sectors exploit the potential that exists. It is recommended

that AIC Seed Division and the concerned programmes put more development effort into seed production of the neglected crops-grain legume, oilseed and pastures. Seeds for these seeds will become increasingly important as farmers adjust their cropping patterns based on new research findings.

- I. The Hill Seed Programme is unique and deserves as much continued support as possible. Few other countries have attempted a programme of this nature and it will be to Nepal's credit if effective ways can be developed through the programme to assist small farmers meet their own seed requirement more effectively.

Maintaining a seed selling price above local grain market prices will be essential if the programme is to succeed.

VI. Seed quality control

- A. The present seed certification, testing and research programme in the Agricultural Botany Division is making a useful contribution to the quality of seed used. The essential parts of a good system exist, but increased productivity from the existing staff and some increase in staff is needed for the programme to have the kind of impact that is needed. The recommendations from the seminar cover several useful steps that are needed in this aspect of the programme.
- B. The delays in enacting seed legislation have been appropriate because it is good for the programme to improve and gain experience before operating under legal requirements. However, if the proposals to increase the involvement of the private seed industry move forward, it would be appropriate to plan for legislation to provide for a voluntary seed certification programme and a truth in-labeling programme on seed sold that is not certified.

- C. In the short-term, administrative orders to require seed sold to be tested and properly labelled would contribute to better seed quality.
- D. The present Seed Technology and Quality Improvement Programme should be responsible to the National Seed Board and would ultimately have responsibilities for aspects of seed law enforcement.
- E. The new seed testing laboratory building should be expanded to accommodate the National Seed Development Office and Seed Certification activities.

VII. Getting the seed used

- A. Present situation
The present extension system works primarily to collect the demand for seed for the AIC. In some cases the extension system distributes seed. The SPISP combines a seed production effort with education and extension about new varieties in the hills.
- B. The recommendations from the seed seminar that stress "demand creation" and improved efforts by extension to promote good seed of better varieties are good and justify serious consideration.
- C. As the research and extension systems work more closely together, it is equally important to draw local seed grower-sellers and "mini seed enterprises" into the team that can link the promotion of new varieties with seed supplies.

- D. The extension system can and needs to do much to activate the seed production-distribution network at the local level as well as increased utilization of good quality seed.
- E. The proposed National Seed Board would need to add to its agenda a review of how the present research and extension programmes can more effectively integrate their work with the development of increased seed supplies at the local level.

VIII. Personnel development, staffing and training.

- A. The National Seed Programme is rapidly building competency especially through the present training effort of SPISP. The proposals made could not be considered without this strengthening of staff.
- B. Much additional training will be needed both within the country and abroad. IAAS should incorporate seed technology in its curriculum.
- C. It is recommended that the National Seed Development Office have a person who can guide and coordinate seed training activities and lead the development of educational and training material on seed.
- D. The productivity per seed technologist does not appear to be as high as one would hope. Improved training, maintaining sufficient incentives for experienced people to remain in seed work and continued improvement in management of seed activities can improve this situation.

IX. Resources

- A. The physical, human, financial and external resources of the National Seed Programme are reviewed and summarized.
- B. Assuming the private sector is encouraged, further expansion of seed conditioning and storage facilities could be made during the next 10 years through that sector; however, some incentives such as credit, tax concessions and the lease of equipment to the private sector should be considered. The public sector should continue to invest in the mini seed house programme. If need is shown, some further investment in foundation seed facilities would be appropriate after some time when the programme expands. The greatest current need is the investment in the spare parts and maintenance on facilities now in place.
- C. If a National Seed Development Office is established, an investment in the extension of the new building for the Seed Technology Improvement Programme would be needed.

The STIP programme will also need additional mobility for the staff and improved facilities for some regional laboratories.

- D. The staff positions included in the report and some strengthening of the AIC Seed Division and STIP will mean added trained manpower for the programme as well as the associated additional financial commitment. These amounts are not large, but they must be recognized.
- E. To achieve the objectives outlined will require the continued external assistance now provided through USAID/IADS, GTZ, SITA/FAO and other donor and technical assistance agencies.

ANNEX - B

Table of Contents and Executive Summary
from the
Marketing and Pricing Policies To Strengthen The
National Seed Program and Support
The Seed Production & Input Storage Project(SPISP)

by

Binod Bikram Sijapati
Krishna Bahadur Hamal

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EXECUTIVE SUMMARY1. EXISTING SITUATION

AIC has adopted base pricing system for collecting seeds. Under this arrangement AIC fixes the base price in advance for the seed growers to minimize the risk involved for the producer. This system was recommended by the Central Seed Production Committee.

A district committee, chaired by ADO with two farmer's representatives and one each from ADB and AIC plus one representative from the government farm where it exists, is responsible to fix the base price. Two prices viz, price at sowing and price at harvesting time are considered. The committee indeed ensures that the seed grower receives the higher price prevailing in the district market centres.

One of the major problem in this type of system is the controversy between AIC and seed growers about the prevailing market price which is considered as the base price by the committee. AIC collects the local market price while seed growers present the highest price which prevails in any part of the kingdom. Moreover, in few of the Tarai districts where seed growers are politically powerful they successfully inflate the market price during the period of collecting market price by AIC. This results into an artificially inflated higher price.

It was observed that only the representative of AIC turns out to be more serious about fixing an appropriate price among the committee members. ADO who wants to have good relationship with the farming community and does not have to directly deal with the price paid to seed growers does not want to make farmers unhappy by

arguing against their proposed price. ADB representative is more concerned about the loan repayment-capacity of its borrowers and, indeed, prefers to see that its borrowers receive highest price so he too does not want to argue against the inflated price. Thus ultimately the whole responsibility lies on AIC officer to bargain and minimize the artificially raised price. The result is obvious.

Due to the quality of seed also the base price between various district was found to be different. For example, AIC has been successfully collecting pre-cleaned seed in the Eastern Tarai while cleaned seeds are not usually available in the Western Tarai. Even though the price in Eastern Tarai is higher than the Western Tarai, farmers are unaware of this fact.

For the sale of seed, AIC has been adopting margin control-cum-uniform pricing system.

(a) Margin Control Pricing System: In this system the selling price of seed includes the following costs incurred by AIC: (i) Procurement; (ii) Processing; (iii) Storage and handling; (iv) Transportation; (v) Dealer commission; and (vi) Other cost such as storage losses, incidental and administrative expenses. AIC has developed norms to include these costs. This type of system has got both advantages and disadvantages. Among the disadvantages the problem of variation of price between two lot of seeds in a district is common. The other being the margin itself which sometimes becomes too low to encourage sales promotion activities.

(b) Fixed Uniform Pricing System: AIC declares fixed price in a particular time of the year throughout the country. The price thus fixed covers both production and distribution costs. The main objective of this type of pricing system is to promote the use of seeds throughout the country. Other advantage of the system is that

the price becomes same in all parts of the country. However, the major disadvantage of this system is that in those areas where farmers can keep their own seed they are not likely to use the costly certified seeds. Moreover, it is extremely difficult to set the best uniform price across different geographical regions at different stages of market development.

The farmers are entitled to receive 30-35 per cent as premium price as an incentive to produce better quality seed and participate in the seed production program. The first installment is given right after the seed is procured (usually 10-15 per cent) and the remaining per-centage is offered after the quality of the seed is tested in the seed testing laboratory.

As regards the policy on subsidy, there are two types of subsidies viz transportation and price subsidies. In the remote hilly areas the transportation cost is subsidized by HMG upto the headquarter of the district. However, there is no provision of subsidy to carry seed from district headquarter to other parts of the district. This type of situation has adversely affected the utilization of seed produced within the district. Sometimes the price of locally produced seed becomes higher than that brought from Tarai Districts.

In order to promote the use of improved seed, the government has also started subsidizing the price of seed by revising the price at the time of sowing. However, the delay in the process of decision making is creating a situation of uncertainty among the farmers. Those who can afford to wait for the government decision to reduce the price wait till the last hour. However, the poor small farmers from high altitude regions who needs to broadcast seed earlier in the season can not wait and buy at a higher price in the beginning itself. They receive no compensation later on.

2. ISSUES AND RECOMMENDATIONS

I. On Quality of the Product:

The production of high quality seed is a complex technical activity. Sound policies, good management, trained manpower, & modern facilities are some of the pre-requisites for producing seed that is superior in quality.

In order to maintain quality of seed following recommendation has been made:

1. AIC must stop collection of seeds from local market to meet the unprecedented demand for seed created either by adhoc decisions of the government to launch a new program or fluctuation in demand due to other factors. This type of situation causes erosion of AIC's reputation and defeats the purpose of quality control.
2. Bagging and tagging and stamping of brand name should be done by trained technicians and once sealed the bag should not be opened till it is used by a farmer. Unauthorized opening of bags by transportation contractors in hilly areas is common and must be stopped.
3. Sajhas as well as AIC should not store sensitive seeds with fertilizer and chemicals.
4. Godown fumigation both by AIC and Sajha should be carried out regularly and effectively.

II. On Effective Seed Selling:

1. It is recommended that AIC should review and strengthen its retail business of seed. The system should ensure

supply of quality seed to farmers. It was learnt that in some cases Sajha people even mixed seeds with cheap quality grain to make more profit. Such things destroy farmers faith in seed supply system.

2. Training of Sajha managers in seed preservation is lacking. This should be intensified.
3. In order to attract both Sajha and private dealers there is a great need to raise the existing level of commission.
4. The transportation contractors should be given incentives or effective discipline must be maintained for timely delivery of seed at destination in hilly areas.
5. Some projects such as IRDPs distribute free or subsidized seeds. It is doubtful if there is any coordination between AIC and such agencies. The seed growers in the affected areas are unwilling to pay for source seed in seed multiplication program which underlines the need to harmonize seed subsidy policy with seed production programmes.
6. In order to enhance the use of AIC seeds, mass campaign by extension agents and sales promotion by AIC officials should be launched.
7. Even in mini-seed house areas, most hill farmers still have to use old varieties because better and reliable varieties are not available for hill areas. There is a need to intensify research in this direction.
8. Apart from what has been said in No.7, good quality seed generated by mini-seed houses should be effectively utilized. Thus there is a clear case to link the availability of improved seed with programs for extension and increased crop production. For this purpose, the Department of Agriculture and AIC have to work in close cooperation.

9. As regards seed demand, it was learnt that AIC determines the effective demand based on past trend and consultations with the ADO. Since demand elasticity depends on a host of variable factors it is extremely difficult to develop a standard model for forecasting. However, in the main report an attempt has been made to develop a realistic model as an improvement over the existing system.
10. It has observed that availability of fertilizer promotes the use of improved seed and vice-versa. Taking cue from this reality, we recommended that AIC should, especially in hill areas, create an impression that the farmers using improved seed will not face shortage of fertilizer. Such an approach would enhance the value of mini-seedhouse in the minds of farmers and the government will achieve rapid coverage with improved varieties.

III. On Pricing Policy:

1. AIC should develop its own market intelligence to be able to fix a realistic price at the time of signing agreement with its growers. For this purpose field level training of staff is necessary.
2. The price committee system may be dispensed with, but at the same time AIC should allow flexibility in upward price adjustment if the price of inputs rises and the seed growers deserve to be compensated. In our opinion there is no substitute for AIC's own commercial and fair judgement in this matter.

3. Individual mini-seed houses in the hills should have the option to fix a local sale price for their seed on a cost plus basis in the event the AIC general sale price is significantly higher as compared with the local market. This would help to remove the 'L' farmers' common grievance that they have to buy seed at a high price applicable to Tarai areas.
4. The final sale price of seed should either be declared in advance of the season or in case of later reduction, the earlier buyers should receive a refund.
5. The whole subsidy policy must be looked from at least two perspectives, viz, financial burden on AIC, if any, and the macro-implications of the policy. Perhaps, there is no reason for AIC suffer losses in seed business, subsidy or no subsidy. Farmers are usually concerned more about seed quality than price and thus there exists some scope for increasing the seed price to a profitable level. Of course, marginal support through price subsidy would be well justified if it leads to larger national production through improved seed consumption.

The transport subsidy, however, is a different matter in view of the harsh terrain in the hill districts. We feel transport subsidy should not only continue in the future, it should also be extended to transportation of locally produced seed from the mini-seed houses to other panchayats in remote parts of the same district. The quantum of such a subsidy can be decided in consultation with the district agencies.

6. The present system of subsidy whether, in transportation or otherwise, is working against the interest of farmer-run system of seed production in the hills. Therefore, we recommend the seed produced by mini-seed houses should be uniformly eligible for subsidy.

IV. On Mini-Seed House Management:

1. Additional mini-seed houses should be created in the isolated parts of the kingdom so that the burden of subsidy can be reduced. Attempt should be made to keep the seed houses within a production belt.
2. The farmer-run-system should be encouraged in every way possible, including incentives, assistance, subsidy etc. Thus, each mini-seed house can make its own decision on issues like demand, prices, commission according to local conditions. This managerial advantage cannot perhaps be realized if all the 20 mini-seed houses dispersed far and wide are to be controlled by a centralized official agency.
3. Moreover, we think that the site JTs should be AIC employees instead of deputationists from Department of Agriculture because for all practical purposes it is AIC that has the responsibility for executing seed production plans. We suggest that a way should be found out by which AIC can directly receive compensatory support from the Ministry of Agriculture for employing site JTs. That would correspondingly reduce the financial burden of the Department and hence will not involve additional expenditure.

ANNEX-C

From the

Seed Program Development Strategy

Table of Contents: Recommended Action Plan
and Selected Readings
from Seed Program and its Components
Promotion of Private Seed Industry in Nepal,
Coordination of Seed Programs,
and selected portions of papers dealing with
seed marketing and pricing

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RECOMMENDED ACTION PLAN

Presented by:

T.N. Pant, Joint Secretary
Ministry of Agriculture

Mr. Chairman, Secretary of Agriculture
Distinguished Delegates
Ladies and Gentlemen

You have just heard the recommendations from the Chairpersons of the four discussion groups. In essence the deliberations of the seminar reemphasize the inaugural address by the Hon'ble Minister of State and also address made by the Hon'ble Assistant Minister and the Central President of Peasants Organization regarding the increased availability of seeds to our farmers. Likewise the seminar has observed that Nepal would not be self-reliant in seeds unless a comprehensive national seed program was formulated. Since the recommendations are wide-ranging, often touching on specific details, we have made an attempt to condense the salient ones into a summary form. This should not, however, undermine the significance of the group recommendations that have already been presented. I now read the major recommendations that have finally emerged:

1. A National Seed Board consisting of technical committces should be established at the highest level.
2. There is a strong need for a separate coordinator of foundation seed in the country.

3. The Seminar recommends that based on feasibility either the AIC set-up be restructured to ensure due priority to seed or a National Seed Corporation created as early as possible.
4. In the interest of seed quality the Seed Technology and Improvement Program should be strengthened along with an internal quality control system in AIC. Moreover, minimum quality standards of germination and purity for certified seed should be observed by the seed trade.
5. In order to give better service to farmers the system of seed supply, promotion and pricing needs to be streamlined as per seminar recommendations. In the same context AIC should increase its direct touch with farmers.
6. Private seed industry should be encouraged.
7. The coverage with quality seeds of improved varieties should be doubled within the next five years.
8. The hill seed program should receive developmental assistance during the formative years.
9. Concessional interest rates on loans and exemption from duties and taxes are recommended for the seed industry.
10. Seed storage facilities at district and retail level should be improved.

REPORT OF GROUP A

SEED PROGRAM AND ITS COMPONENTS

Chairman: N.S. Rana

This group met in the Garden Hall on the 18th and 20th February 1983 and discussed the above topic in a very cooperative manner. There were 34 members in the list but the actual number fluctuated during the sessions which was not unexpected.

Luckily for the group, B.N. Kayastha, S.S. Bal and many other interested participants had prepared a draft on the topic, which was used as the main source for the discussion.

As regards strengthening seed program components under AIC and STIP, the recommendations were as follows:

1. National Seed Board

The main recommendation was that CSFC (Central Seed Production Committee) should be upgraded and named as National Seed Board. This Board is to be headed by the Secretary of Agriculture and it should have technical committees on the following:

- a. Variety release and maintenance
- b. Seed Quality standards
- c. Seed planning

Other related recommendations were as follows:

- (1) Members of the Board may include representatives from MOA (Chairman), Ministry of Finance, DOA, AIC, Private Seed Industry, ADB, Cooperative Department, IAAS(T.U.' and Coordinator of foundation seed.

The Secretary of this board could be either from AIC or Department of Agriculture.

(2) Functions of the Board

- To formulate a national seed policy and ensure its implementation.
- To identify and provide solutions to the problems hindering the growth of seed industry from time to time.
- To coordinate the seed production and supply activities of the various projects to serve national goals. Also to seek and coordinate foreign assistance according to need.
- To undertake promotional functions including financial support to seed certification, training, seed technology research and hill seed production effort.
- To deal with issues relating to seed pricing.
- To oversee the functions of the committees on variety release, quality standards and foundation and certified seed and any other matters bearing on the development of national seed program in Nepal.
- Since there is a need for a seed organization, a pre-feasibility study for opening another Corporation for seed specifically, such as a Seed Organization of Nepal, should be initiated.

2. Foundation Seed

Main Recommendations

A senior technical officer should be immediately appointed as the Coordinator of foundation seed. He should be within the Department of Agriculture.

The Coordinator should make an in-depth review of the physical, financial and manpower needs and come up with an action plan for necessary consideration and approval by seed planning committee. The Coordinator should be exclusively responsive for all aspects of foundation seed, including quantity, quality, allocation, storage and supply.

Related Recommendations:

- Jhumka and other suitable farms be declared as foundation seed farms and placed under the control of the Coordinator.
- Activities on the foundation seed processing and storage facilities at the commodities stations may also be coordinated.
- All foundation seed be certified except perhaps the initial release seed of a new variety. The breeder should be involved in determining the genetic purity of each variety.
- While allocating the available foundation seed, top priority should be given to AIC and private enterprises which produce certified seed.

- In crops such as wheat the certified I seed should be taken as source seed for all practical purposes in case of shortages.
- The price of foundation seed should be higher than certified seed.
- The quality of foundation seed should be top class in every respect.

3a. An Organization for Certified Seed

Main Recommendations

The existing seed set-up in AIC should be reviewed to ensure desirable changes that can ensure proper priority to seed at all levels. With this in view the AIC's Board should appoint a special committee (with various disciplines included) at the earliest. This group should go into the question of re-organizing management of seed activities under the AIC and the mechanics of doing so most effectively.

Related Recommendations

- Improve seed storage facilities in AIC
- Improve seed staff mobility
- Set-aside sufficient contingency budget for smooth management of processing plants and storage godowns.
- Introduce internal quality control system in AIC under a senior officer reporting directly to the chairman.
- Adopt a policy of supplying only certified seeds, as far as feasible.

- Devise, ways to ensure a more direct relationship between AIC and the seed consuming farmers on the one hand and AIC and Sajhas on the other hand.
 - Enlarge the retail network for seed marketing so as to be within easy reach of every panchayat in most parts of the country.
 - The possibility of AIC having some of its own retail outlets should be examined.
 - AIC should assist Sajhas in creating proper storage facilities for seed at the retail outlets. Issues such as dealers development and their knowledge of the product should receive due attention through training and discussions.
 - c The size of the seed bags for different crop seeds should be based on farmer needs and convenience.
- 3b. The recommendation that, STIP be a separate entity under the DOA was approved by this group.

4. Manpower Development

Main Recommendations:

In order to cope with the future needs of the rational seed program, the following training plans should be implemented:

- a. Introduce seed technology courses and short-term training programs in IAAS (Tribhuvan University).
- b. The STIP should hold regular in-service seed technology training courses for the benefit of the entire seed industry.

Related Recommendations

- The training opportunities offered under different projects should be fully utilized so as to develop competent cadre of seed technologists, engineers, technicians and managers for handling the growing seed program.
- A seed technologist in each of the national commodity programs needs to be included so that there is proper maintenance breeding and morphological description of the various recommended varieties.
- A vegetable Coordinator with an organization like the cereal commodity programs should be instituted so that the vegetable research, training, extension and seed improvement program can gain due momentum in a short period of time by further strengthening the Vegetable Development Division.

5. Hill Seed Program

- (1) The new hill seed production program for the small farmers should be considered as a promotional and developmental activity for a period of at least five years. If and when special assistance to this program is necessary, it should be readily extended through the aegis of the National Seed Board.
- (2) AIC should create a special cell to look after the working of the hill seed production program, ensure coordination between different projects and help remove the constraints from time to time.
- (3) There should be a provision to produce forage and grass seed.

6. Seed Quality

Main Recommendations

- a. The seed certification should be voluntary and, with the increase in manpower and facilities of STIP, certification should be extended to other crops, vegetables and potatoes besides cereals and pulses.
- b. The seeds quality standards committee with the concerned disciplines should establish minimum quality standards for seed purity and germination for other crops and vegetables not covered by certification.
- c. Only the registered seed companies or growers corporations need to have their seed samples officially tested and labelled for general sale.
- d. Any variety introduced from abroad should be tested for germination and physical purity and should meet plant quarantine standards. If such varieties need to be sold on a large scale in the country that must be done in collaboration with the National Commodity Programs.
- e. Seed legislation should be initiated in the country as soon as possible so that isolation requirement of cross-pollinated crops and standard of seed marketing are met.
- f. There should be provision to prevent farmers from growing off-type plants in cross-pollinated crops seed production areas through administrative orders from the Agriculture Department.
- g. Research on seed technology, seed pathology and entomology should be strengthened.

Related Recommendations

- (1) AIC should handle foundation and certified seeds supply and only in cases of emergency should it handle "emergency seed" selling it in separate plain bags after testing for seed purity and viability.
- (2) Each year in different regions AIC should keep buffer stock of various seeds.

7. Infrastructure Facilities

Main Recommendation

Steps should be taken by AIC and STIP for efficient management of seed drying and processing plants, seed stores, central-regional seed testing laboratories and proper maintenance of the equipment used in these facilities.

Related Recommendations

- AIC should improve the capacity, design and management of its seed stores.
- On-farm seed storage in outlying hilly areas should be intensified through the use of metal bins and suitable bins of local origin.
- Efforts should be made to preserve maize seed quality through the use of artificial drying. Simple cob dryers using corn-cob or solar energy for fuel should be used.

- A mobile servicing unit to service and maintain seed processing plants of AIC, HMG stations and farms should be brought into action as soon as possible.
- Minimum facilities should be made available to further studies and training at IAAS, Tribhuvan University.

8. Seed Demand and Coverage

Main Recommendation

The coverage with improved seed is presently low. It should be at least doubled within the next five years. To cope with this challenge, the seed program should be expanded and strengthened. By the end of VII Plan, 20 percent area of wheat, 20 percent of maize and 12 percent of paddy should be receiving certified seeds through institutional supply system.

Related Recommendations

- The extension services should be mobilised for creating seed quality consciousness among the farmers upto the ward level.
- The seed program should handle area specific improved varieties so that they can spread rapidly.

REPORT OF GROUP BPROMOTION OF PRIVATE SEED INDUSTRY IN NEPAL

Chairman: S.K. Upadhyaya

In Group B, there were 12 participants, who participated in the discussion with full interest and cooperation. The group mainly concentrated its discussion on problems and suggestions on the promotion of private seed industry in Nepal. The major recommendations made by the group in general are as follows:

1. Private seed industry should be grouped into categories.
 - a) Seed growers and marketing groups.
 - b) Individual farmer seed growers and sellers
 - c) Seed companies
 - d) Contract growers for AIC seed companies.
2. Registration of the seed industry should be done by the Department of Agriculture.
3. Policies should be developed to form a National Seed Board.
4. The hill seed program should get special attention and support from the concerned sectors as it is a promotional activity to serve the small farmer.
5. The basic minimum prices of the seed should be fixed taking into account the cost of seed production, processing, storage, cost of transportation, interest or capital involved, degree of risk and percentage of profit involved, and again at the time of sale, if the market price is lower than calculated price, the government should subsidize the difference in price.

6. In the beginning, private seed industry should get subsidy facility as AIC gets.
7. The sale tax/custom duty should be exempted on seed production, processing storage, tools, equipment and inputs. The Department of Agriculture should prepare a list of the equipment, tools and inputs required for starting a seed enterprise.
8. The seed industry should be exempted from tax for at least 10 years.
9. Credit agencies should provide loans to cover fixed and working capital needs of seed enterprises at reasonable rate of interest. In hill areas, mini metal bin program initiated by ADOs in some districts should also be considered for loans and a detail study on the possibility of expanding such programs should be thoroughly studied and implemented.
10. In the beginning all private seed industry should get free quality tests and inspection services, and regular supervision from Department of Agriculture. The government should strengthen its technical manpower to intensify its supervision, training, and certification system.
11. The private seed industry should be encouraged to enter into the contract with the counterpart foreign private industry for production and export of seeds when foreign foundation seed is used and production and export of certified seed of Nepalese recommended varieties.
12. The private seed industry should be allowed to market the new variety with minimum period of testing in a crop program.

13. Training in the country and abroad should be extended to private seed growers from time to time.

The government should provide the required foundation seed. If possible, autonomous commercial foundation seed production farms should be established. Government farms also should be expanded.

14. While formulating summer seed program the government should consider the private seed industry contribution, on both demand and supply of seed.
15. On the district seed committees, there should be representatives from the private seed industry.
16. Department of Agriculture should provide technical guidelines/ manuals on seed packaging, storage and processing to the private seed growers.
17. Every year, a national seminar on seed should be held to discuss the problems related to seed activity.
18. Lastly all private seed growers should pay more attention on producing quality seed and should comply with minimum standards fixed by National Seed Board.

REPORT OF GROUP C
COORDINATION OF SEED PROGRAMS

Chairman: M.L. Pradhan

After thorough deliberations and lively discussions, the group felt that although there is a Central Seed Production Committee it has not been able to function effectively for the following reasons:

1. The committee consisted of persons whose time was demanded much by other duties.
2. Even if the committee met, because of its advisory nature it could not speedily obtain approval regarding, pricing and subsidy policies from the Ministry nor could its decision be carried out by the farm centers concerning production of foundation seeds in more hectare.
3. The committee in practice was cereal crop specific and the problems of the other crops did not receive due attention.
4. There has also been a need for coordinating seed activities of various projects outside the direct authority of the committee.

Observing the aforesaid flaws, the group suggests the following institutional improvement.

1. National Seed Board (NSB)

The function of the NSB should be to formulate policy guidelines covering all aspects of seed. This Board should be chaired by the Honorable Minister of Agriculture with the following members:

- a. Member, National Planning Commission (Agriculture) -Member
- b. Secretary, Ministry of Finance - Member

- c. Secretary, Ministry of Land Reforms - Member
- d. Secretary, Ministry of Forestry - Member
- e. Secretary, Ministry of Agriculture - Member Secretary

The policy decided by the NSB should be implemented by an Executive Committee headed by Secretary, Ministry of Agriculture with the following members:

1. Director-General of Department of Agriculture
2. Director-General of Department of Livestock and Animal Health
3. General Manager, ADB
4. Registrar, Department of Cooperatives
5. Chief Conservator, Department of Forest
6. Director-General, Food and Agriculture Marketing Service Department
7. General Manager AIC, Member Secretary.

To support the Executive Committee in technical matters there should be permanent technical sub-committees. These sub-committees will analyze the problems in their respective fields and will function as coordinators between the Executive Committee of the NSB and various functionaries on seed matters. The technical sub-committees envisaged are:

1. Cereal and grain legume
2. Vegetables
3. Horticultural (Potatoes and Plantation Crops)
4. Industrial Crops (Jute, Tea, Sugarcane)
5. Forage
6. Marketing

Other technical sub-committees may be formed as and when required.

2. Seed Production Quality and Distribution

The group and the house critically reviewed prevailing situation with AIC. This group proposes to strengthen the AIC seed division by giving it entire control over the administrative and budgetary matters on seed supply.

If this is not possible a National Seeds Corporation should be established as a separate body.

3. Seed Distribution at District and Panchayat Level

The current system was reviewed and three different systems were identified. They are: AIC regular system through branch and sub-branch offices, SPIS Project mini seed-houses in areas where about 40 m.t. of seed can be produced and seed banks.

The group concluded that more mini seed-houses should be established where potential for these exists and resources permit. In areas where is not possible farmers' seed banks should be established.

REPORT OF GROUP D
PROMOTION, PRICING AND MARKETING

Chairman: P.R.B. Mathema

Discussions of seed promotion, pricing and marketing group were held on two days. The recommendations made were as follows:

Recommendations:

A. Seed Promotion

1. Sales promotion activities for improved seeds should be developed. Regular radio broadcasting is recommended with proper coordination with DOA and Radio Nepal.
2. Time schedule for dispatch and delivery of seeds to district head-quarters should be fixed in advance.
3. An estimate of cropwise and varietywise quantity of improved seed demand by the farmers should be made at least one year before the sale season. The estimated quantity should be kept on view formulating seed production programs. It is also recommended that the varieties and prices of seeds, that would be made available for sale during up-coming season, should be known to the field level staff 5-6 months ahead of sowing season, and effective demand should be collected on the basis of feedback information.
4. The field level extension workers (JT, JTAs) should be involved mainly in demand creation. The group recommends that they should not be much involved in seed demand collection. The village

level and district level cooperatives, the main retail outlets, should be made more responsible in seed demand collection. The group also strongly recommends that institutions involved in seed production should increase direct contact with farmers. Additional technical personnel should be deputed in AIC for those purposes. Those personnel should also make regular supervision of village level cooperatives and, thus, should also act as seed quality controllers Sajha level.

5. Agriculture Assistants should be given incentives and encouraged if they take seeds direct from AIC office on cash and sell to the farmers. Such incentives should be more in the hills. The extra amount of commission needed for the hills should be subsidized by the government.
6. The present commission rate to Sajha and private dealers is inadequate and it is therefore recommended to revise them upward.
7. The group strongly feels and recommends that packing size should be appropriate for different crops and in different areas. Packaging should be done centrally or at the processing centers.
8. Seeds that could not get sold by Sajha Cooperatives due to untimely delivery made to the cooperatives should be taken back by AIC.

B. Physical Distribution

1. It is recommended that seed storage facilities at the retail level should be promoted. The storage facilities should also be promoted in district AIC offices.
2. Taking into account the nature and condition of roads appropriate means of transportation should be adopted in order to minimize transportation cost.
3. The announcement and payment of tender for seed transportation should be done by the receiving district offices. A minimum standard rate should be decided and the bid below that standard should be rejected.
4. A feasibility survey for additional cold storage in the country for storing potato seeds is recommended.
5. Private sector should be encouraged for the establishment, management and operation of cold storages.
6. In the mid and high hills low cost house-scale potato storage structures should be encouraged to enable the farmers to store their own potato seed requirement.

C. Pricing

1. There should be a nation wide uniform price in all the districts up to the AIC outlets. However, special consideration should be given for price in such hilly areas where seeds are being produced locally under special programs.
2. It is recommended that special seed subsidy program should be developed and launched out for highly inaccessible remote areas of hilly districts.

D. Organization and Management

1. Majority of the members expressed the need for a separate seed corporation. The group also recommended strongly that a thorough feasibility study should be carried on this aspect.
2. The district and village level cooperatives have the main responsibility in carrying seeds from district headquarters to production areas. Experiences have shown that the cooperatives are not able to serve the farmer's need efficiently. Hence a restructuring of the cooperatives and also a provision of alternatives like private dealership are recommended.
3. External as well as internal management training programme for the personnel involved in seed business should be expanded.
4. AIC should expand its scope of seed business for other crops like fodders, green manures, pulses, etc.

Towards a Stronger Seed Program
by S.S. Bal

Specific portions of the paper dealing with Nepal are presented below:

Prospects for seed ventures in Nepal

On the whole the prospects for a public sector enterprise appear more favourable at the present time. At the same time, considerable scope exists for private enterprises specializing in vegetable seeds and hybrid maize seeds to make a start. For a new enterprise in Nepal, the following factors are pertinent and should be taken into account:

- a. Seed demand is sufficiently high because farmers in general are unable to keep seed themselves due to factors such as food deficit, vagaries of weather, rodents, storage pests etc.
- b. Agro-climatic diversity is a unique feature in Nepal such that a variety of seeds including temperate and tropical vegetable seeds, can be successfully produced.
- c. As HMG attaches considerable importance to seed supply, a new seed production enterprise can expect to receive all encouragement, such as supply of foundation seed, processing facilities, seed testing and training services.

- d. The seed program has been on-going for atleast a decade and hence trained personnel are obtainable.
- e. The cropping cycle of most seed crops is favourable as it does not necessitate long period of seed storage between harvesting and planting. For example, six months storage is maximum for wheat and maize and even less for rice.
- f. Superior seed varieties are steadily coming out of the research program.
- g. Seed quality consciousness exists among the farming communities.
- h. Considering the long-east-west dimension of the country and 80 percent hilly terrain, a seed marketing venture is expensive, problematic and challenging.
- i. Some production areas are prone to the adverse effects of high humidity, field moisture stress, low seed yields, lack of transport and communication (some of these aspects are already improving).
- j. Safe seed storage might demand the construction of good seed stores not only at the plant-sites and relay centres but at the retail points as well.
- k. The farmers purchasing power may not permit them buy seeds at the commercial price. This may force dependence on governmental support through subsidy for sometime to come.

12. Current seed situation in Nepal

Although the seed program activities are still in a formative stage, the infrastructure that has developed is quite impressive. A fairly systematic approach to seed production is being followed. Seed processing and storage facilities exist in seven places in the terai and a couple of places in the hills. Additional small scale facilities in about 30 hills sites are being created under the SPIS Project. The country has four seed testing laboratories. Foundation seed production facilities at three research stations are being developed. Training programs for developing technical manpower are underway. An extensive set-up for vegetable seed production has been established under the aegis of Department of Agriculture and AIC with ^{FAO} assistance. Thus, all in all, the situation lends hope and optimism on the seed front.

A separate Seed Division in AIC came into existence in 1973. The Central Seed production Committee was formed in 1974 and the first seed testing station at Khumaltar started functioning in 1965.

The AIC has the capacity of producing and supplying roughly 6000 m.t. of cereal seeds annually besides vegetable seeds. Seed certification activities are carried out by the Seed Technology and Improvement Program of the Department of Agriculture.

However, inspite of the wide ranging seed development activities, there seems a need to refurbish AIC's seed image and credibility among the generality of farmers. With a little bit streamlining of the system, the country's seed program can achieve the capability of adequately serving the farmers. But unless that is done, any perceptible improvement may not come by in the foreseeable future. By now sufficient practical experience has been gained by the seed personnel on the basis of which mid-course corrections can be made for meeting the future challenge. The existing seed program has

indeed served the first generation needs; however, at this juncture, new strategies have to be developed for a desired impact in the time to come.

For this purpose, it would appear logical to first identify the constraints in the present set-up through an objective analysis of the situation and then, by a consensus, an attempt might be made to remove the apparent deficiencies so as to strengthen the entire seed program to make it move forward in meeting the ever increasing demand for high quality seeds.

It is pertinent in this context that Nepal has a great potential for producing a variety of seeds especially vegetable seeds for the export market. In order to exploit this potential, the development of seed industry is an imperative. The reputation of the seeds produced and supplied within the country or outside must be built up by sustained efforts. Any investment made now to strengthen the seed program will surely pay handsome dividends in the future.

13. The constraints and their remedies

Consultations and discussions with the managers of seed program activities on the one hand and farmers opinion on the other hand have strongly pointed out the need for some policy changes in the present system. These are discussed below with a view to finding out rational solutions.

1. Foundation seed arrangements

These appear to be inadequate. The linkage between the commodity program as the producers and the AIC as the user of foundation seed is rather weak. For the private sector too, the supply of foundation^{seed}/is uncertain. Various projects having to do with seed production also experience

problems with foundation seed. If foundation seed remains a bottleneck, the subsequent seed multiplication will be adversely effected.

Suggested improvement

There should be a separate unit for foundation seed under an experienced seed technologist. The proposed unit may be responsible for the foundation seed production aspects at each of the commodity stations. The unit could also establish a new foundation seed farm of a suitable size fully equipped with necessary facilities to serve as the coordinating centre for foundation seed.

All foundation seed should be certified except perhaps the first supply at the time of releasing a new variety. The impurities in breeder seed, if any, should be removed at the stage of foundation seed through rigorous rouging. There should be a buffer stock of foundation seed of the established varieties. In case of maize composites, enough foundation seed should be produced to ^{at} least for 2-3 years under long term storage, so as to avoid genetic shift.

The allocation of foundation seed may be entrusted to a committee. For field inspections, the breeder and a representative of AIC should accompany the seed certification inspector to ensure proper determination of purity.

Lastly, the present shortage of foundation seed should become a thing of the past as early as possible. Whatever needs to be done for that should be done expeditiously.

2. AIC's seed set-up

As we all know the AIC's performance in meeting the seed requirements of farmers has been questioned in the past and in spite of the recent improvement the situation is not completely satisfactory. The root cause of the problem, apparently, is the fact that the AIC is primarily a fertilizer organization. For a tangible improvement, an institutional change is necessary such that seed activities can be properly looked after and managed by technical personnel. Experience elsewhere shows that seed production is a specialized job and should be entrusted to a professionally-oriented agency. As time passes and country's seed demand increases there are likely to be greater difficulties in the future unless a seed organization is created now and made responsible to cope with the growing needs.

On the other hand, it would appear that there are certain advantages in AIC dealing with seed. The main advantage is that the existing infrastructure can be utilized for handling and distribution of seed without creating another parallel system. But even that is the case upto the district level as the retailing responsibility rest primarily with the cooperatives.

The present seed set-up of the AIC seems deficient in the following respects:

- a. Inadequate linkage with research, extension and foundation seed programs.
- b. Less concern with seed marketing as the role is confined to mere distribution of seed upto district headquarter.

- c. Lack of direct touch with the end-user farmers because of Sajha serving as intermediaries.
- d. Ineffective management of seed production activities, dispersed as they are.
- e. Seed receiving secondary attention being a tiny component of the whole organization.
- f. Paucity of specialised technicians and seed technologists to run the seed production activities.
- g. Neglect of internal seed quality control procedures.
- h. Casual maintenance of seed stores and processing plants.
- i. Minimal supervisory check of field work to ensure achievement of targets.
- j. Inadequate liaison with the seed certification unit of DOA.
- k. Defective seed lot identification and erratic labelling.
- l. Inadequate exercise of commercial judgement on issues such as demand forecasting, pricing and sale promotion.
- m. Administrative and financial constraints at different executing levels affecting implementation of the plans.

Suggested improvement

An organizational change seems to be the first necessity. Under AIC management, a subsidiary agency for seed might be created. It could be named as Seed Organization Of Nepal (SOON). The head of the SOON should have the complete responsibility for all aspects of seed production, processing,

storage, marketing with necessary financial and administrative powers. He should be assisted by divisional managers looking after (a) seed production and quality (b) storage and marketing (c) seed drying and processing and (d) administration and finance. The SOON should function in a decentralized way with a built-in quality control system. A seed processing plant site should be the nerve centre of all the activities. AICs existing district offices can be used for demand collection, secondary seed storage, transportation and supply of seed to Sajhas. To ensure sales promotion and linkages with the Sajha sale outlets and through them with the farmers, the seed marketing officers of the SOON should be assigned area-wise responsibility. Besides marketing, quality assurance functions should be combined with the marketing officers as well so that the consumer can receive the desired service.

While it is recognized that the SOON would entail increased working expenses for AIC, a rough estimation shows that there will be ample scope to increase the turn-over on account of seed sales to offset the expenditure. The SOON can eventually reach a gross sales revenue of about sixty million rupees annually which appears sizeable for a seed organization to be viable.

<u>Crop</u>	<u>Assumed area (m.ha)</u>	<u>Approximate total seed requirement m.t.(area seed rate)</u>	<u>Desirable target for seed supply m.t.</u>	<u>Estimated Sale Value (m. rupees)</u>
Paddy	1.20	45000	4000	12
Wheat	0.40	35000	8000	36
Maize	<u>0.45</u>	<u>10000</u>	<u>3000</u>	<u>12</u>
	2.05	90000	15000	60

Since the question of re-structuring AIC for strengthening its seed activities is a major issue, the precise feasibility and the modalities of the suggested action need to be gone into by a team of experts. This should follow if the matter is acceptable in principle and a consensus is reached to that effect. If possible, the private seed growers should be encouraged to make their contribution in some kind of a joint sector seed organization.

3. Uncertified seed

At present AIC handles three types of seeds namely, certified seed, improved seed and grain-seed, without a clear distinction from the customers point of view. This has been eroding AIC's credibility as the supplier of good seed. The quality aspect obviously gets a setback in this kind of situation.

Suggested improvement

As far as possible, the AIC should stick to the production and supply of certified seeds only. But in an unforeseen situation arising from drought or crop failure in a particular year, if it becomes unavoidable to handle some grain-seed then that seed must not be packed in the same kind of bags as for certified seed. Grain-seed can be supplied in large gunny bags instead. The ideal situation would, however, demand that grain-seed should not be handled by AIC but by some other agency.

4. Seed subsidy

The phenomenon of demand elasticity in relation to price of seed has been amply demonstrated in the recent experience with wheat seed. With sale price subsidized to Rs. 3.75 per kilo the sale volume jumped from the normal 3000 m.t. to 5000

m.t. It is true that majority of our farmers are small with a limited capacity to pay the commercial price of seed. Hence, till the farm productivity rises and incomes improve, there might be a need for a supportive subsidy to promote the use of improved seed as a national strategy. However, subsidy can be harmful if not properly handled. The subject deserves a very careful consideration at the policy level.

Suggested improvement

In deciding the quantum of seed subsidy, the criterion should be the difference between AIC's commercial sale price and the price that farmers can possibly bear. In any case, the subsidized price should be at least 10 percent above the prevailing market price of fair quality grain. Secondly, subsidy should be applied to certified seed and equitably to public and private sector seed to avoid any counter productive effect.

5. Training and education

Training of all staff engaged in seed activities is highly essential. The future needs of the seed program are likely to multiply manifolds. The quality of seed supplied to farmers will very much depend on the quality of the personnel. People working for the seed program activities must have the basic knowledge of seed biology, seed physiology and also seed technology.

Suggested improvement

Under the Seed Technology and Improvement Program of the Department of Agriculture, a seed technology training centre should be established. It may hold at least two in-service training courses annually for a duration of 6-8 weeks. The program should continue as long as it is necessary.

Secondly, any new staff recruitment for the seed program activities should specify a minimum of bachelors degree as the qualification and that too in subjects like agronomy, plant breeding, seed technology, botany, horticulture depending on the area of responsibility. This education should be supplemented by training in management.

Furthermore, efforts should be made to teach some basic courses on seed biology, seed physiology and seed technology to the under-graduates students at IAAS, Rampur so that the people working on the extension side will also have an appreciation of the value of good seed for education the farmers in this respect and thereby help create seed quality consciousness in the villages.

6. Seed marketing strategies

A glaring weakness in AIC's system of seed supply to the farmers is the fact that it has little direct touch with the end-user of its product. The seed goes from AIC production/processing centres to the district offices/stores and onward to Sajha Sansthans. What the Sansthans do with the seed, as the dealers of AIC, is practically left to them. In the process, the responsibility toward the farmers for supplying timely seed gets badly divided between the two agencies. It is doubtful if the Sajhas are in a position to provide any technical advice or after-sale service to the consumers of seed. On the other hand AIC offices are generally oblivious of farmers difficulties because their responsibility is to reach the seed upto district headquarters.

Suggested improvement

The AIC technical personnel at the grass-roots should act as multipurpose staff. A system should be worked out by which they are there in direct touch with the seed users not only for seed supply but also for quality assurance, technical advice, collecting feed back and attending to farmers problems as extension workers.

Secondly, the Sajha Sansthan workers might be continually trained in simple aspects of seed storage, sales promotion and handling of unsold stocks.

7. Seed storage

The climatic and topographic situation in Nepal requires the creation of stores specially designed for keeping seed. Prevalence of storage pests and rodents is a problem in many areas. Vapour proofing of floors and walls, timely repairs, white-washing, periodic disinfection and careful storage management are just a few steps that can improve seed storage. Additionally, some storage structures would need re-modelling to make them fit for seed, e.t., a store with concrete roof is much safer than one with asbestos or tin sheet roofing. Sometimes, mere ventillation can keep the ambient temperature within cool limits.

Suggested improvement

- a) Repair or re-model the existing stores.
- b) Adopt a suitable design and material for new seed storage construction
- c) Improve seed storage management by laying down procedures, inspections and staff training.

8. Hill seed production

The production of seed in the hills to meet the local demand and to win the confidence of small hill farmers is a clear necessity. For this purpose, AIC/SPIS project are attempting to lay minimum infrastructure in selected pockets of the hilly areas. As far as possible, community participation by the surrounding farmers is being encouraged so that they can meet their seed needs through self-help and with minimal support from the government. Several other projects are also helping in hill seed production. Under the vegetable seed program, the tempo of seed production is steadily increasing and there are specialized pockets where this activity is going on.

Suggested improvement

- a) The hill seed production program should be deemed as a promotional activity to serve the small farmers. Maximum financial and material support should be made available according to need. Transport subsidy seems justified and should be given due consideration.
 - b) AIC may create a special cell to assist the hill program by ensuring that dedicated site managers are posted and they give their best in each work site. Also, that foundation seed is supplied for each seed crop, credit is made available to the farmers and the seed produced in the hills is properly utilized.
- ## 9. AIC's internal quality control

It has been seen that a **faithfull** application of the principles of seed science and technology to produce high quality seed requires systematic adherence to certain procedures. A seed producing and selling organization must evolve those procedures

and ensure their application at all times. Thus regular internal supervision at every stage of seed handling is essential. Besides seed certification, a seed organization should have its own control and check system, with the main purpose to ensure in-built quality control, from the point of seed crop harvesting to seed supply to the farmers.

Suggested improvement

AIC should emphasize on internal quality control, in addition to certification. The system might be in-built and woven into production, processing, storage and supply functions. Quality control must be with a senior officer who could also continually recommend to the top management necessary improvements in the physical facilities that might be lacking.

10. Seed certification

At present seed certification is covering only a part of the seed production program due to various reasons. The seed testing laboratories ought to be more fully utilized to attest the value of planted seed in the country. Secondly, the linkage between AIC and seed certification is not as strong as should be such that the certification staff even have difficulty in locating all the seed production fields, ensure proper isolation and roguing by the seed growers and improve the production agronomy for obtaining maximum yield of high quality seed. Essentially, field inspections are also a tool for training the seed growers and upgrading their skill.

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Suggested improvement

- a) Seed testing and certification be intensified.
- b) Staff mobility be improved through the use of motor-cycles alongwith a maintenance allowance to the field staff may be examined.
- c) The drawbacks in seed production and handling system should be monitored by the certification agency and brought to the attention of the Central Seed Production Committee for rectification from time to time.

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Private sector in Agro-seed Business

by

Krishna K. Gyawali

QUALITY ASSURANCE AND CERTIFICATION FOR THE PRIVATE SEED INDUSTRY

1. The objective of the seed testing and quality for the use of private sector is not only to control but also has to provide services for assuring that the seed under distribution is meeting the standards. The certification system should have enough controlling force so that at least the foundation seed provided to the private sector should meet the seed standards, genetically, physiologically and mechanically. Because the distribution and use of foundation seeds influence directly the quality of certified and improved seeds major attention and importance must be given to the maintenance of high quality foundation seeds.
2. The field visits for supervision and inspection in the certification system should be intensified. These visits should not merely concentrate for activities of accepting and rejecting but on the contrary should impart knowhow technique and education to the concerned so that the promotional activities are accelerated.
3. As far as the private sector is concerned, seed could be classified in three categories:
 - a) Foundation seed
 - b) Certified seed
 - c) Truthfully labelled seed.

SUPPORT OF HMG REQUIRED FOR PRIVATE SEED INDUSTRY

Some of the factors influencing the private seed enterprises are:

- i) The activities of private sector are not of aggressive type
- ii) The future growth is not predictable
- iii) The risk is very high
- iv) The market is not assured
- v) The government policies towards the private investment in seed business are not clear.
- vi) The choice of the opportunities in other sectors may be better than seed enterprises.

Taking into consideration, the above factors, the policies of HMG in this regard should be arranged in such a way that the support action flows to the private enterprises; thus in turn they may get encouragement to get involved in the program. Following are some of the points that have to be taken care properly by the government so that there is harmony in the seed business for private seed enterprises.

- i) Minimum prices of seeds should be fixed taking into the account cost of seed production, processing charges, storage charges, cost of transportation of incoming and outgoing distribution, interest on the capital employed, the degree of risk of the capital involved, and the percentage of the profit allowed for (1) growers (2) processors (3) distributors and (4) dealers.
- ii) The flexibility of fetching higher price be allowed in the peak season and also for lowering the price for clearance sale alongwith incentives in sale price, so that the stock does not remain but goes in the soil for planting. This is particularly needed for the retailers.

- iii) Any subsidy in the seed program should flow towards the private enterprises also and equally.
- iv) His Majesty's Government should recognize the seed business as a subsector of industry as seed industry and be treated accordingly.
- v) Like in other industrial and business sectors the seed industry should also get loan facilities upto 90 percent for infrastructural development and operational cost involved.
- vi) The custom exemptions and other facilities should be allowed in seed industry for all kinds of needed inputs including machines and seed transport vehicles as per the allowances given to other industries.
- vii) The characteristics of a seed enterprise are such that it is neither industry nor entirely trading nor simply agriculture. But it is the combination of all these. So the tax exemption should be allowed for the maximum.
- viii) All the seed enterprises should be registered in the Department of Agriculture. Reporting and supervision of seed enterprises should be incorporated in the regular report of the Department of Agriculture. This will facilitate achieving the objectives of the Sixth Five Year Plan of the government.
- ix) The government should also include the technicians of private enterprises in both national and international training, workshops, seminars, observation tours etc. so that the skill and knowledge in private sector can be upgraded.

SUMMARY

The program of the development of seed as an input to fulfill the present requirement and increase the production of agriculture is vitally important. At present in the process of agricultural development, crop research and extension which ultimately filters down to farmers and cultivators, an aspect where private investors could think of contributing is only seed industry, but it requires a congenial situation to be created and protection to be given. At the same time, this industry should provide good return of income in comparison with other sectors for attracting private investment.

Seed Production at Pakhribas Agricultural
Centre

by I.G. Hunter and
M.R. Bhattarai

DEVELOPMENT OF SEED QUALITY CONTROL

With the start of the seed multiplication program, the need for quality control became evident for several reasons - to ensure viable seeds were sold; to ensure that they were of the correct variety; and as is important, to pay the seed grower the premium given for quality seed. In 1979 a seed laboratory was established and began doing quality control work in 1980. Laboratory techniques were established and a technician trained in carrying out moisture content, germination and purity tests to the International Seed Testing Association standards. Testing is not only done on seed crops but also on trial material used by other sections at PAC.

PRICING AND MARKETING PROCEDURES

Purchase price of vegetable seeds is the price laid down by HMG(N). No distinction is made between acceptable and excellent batches of seed. For crop seed, the buying price is worked out by the extension section heads, assistant heads AIC and ADB representatives and farmers representatives. In general, the base price is taken as the market price in the area over a number of weeks. To this graduated increments are added to a maximum of 30 percent, depending on quality-moisture content, germination and purity.

In the past, PAC subsidised the cost of cleaning, treating and bagging seed. This is being phased out. The selling price is now being set to cover all recurrent costs. In setting the price of seed the following is taken into account:

- Buying price of seed
- Labour costs - cleaning, treating
- Chemical costs
- Packing costs

All marketing in the PAC target area is done through the field assistants or JT/JTAs (KHARDEP). They sell seed from the project houses or Agricultural Service Posts. PAC acts as a project house for Pakhribas Panchayat and also distributes seed to selected growers.

EXPERIENCES

One of the recurrent difficulties in the seed program is getting farmers to honour their contract and sell seed to PAC. This is not a difficulty in the local target area, but in the Taplejung District to the north defaulting can occur. In a bad season, crops are poor and in a food deficit area the farmers wish to keep their crops for feed. The PAC northern target area is also on the route north to Wallenchung and Tibet and the farmers get a higher price selling crops to be carried north for food, than they would selling for seed. This illustrates the need for a seed area to be self sufficient in food grain before the sophistication of seed production is introduced. Also some sort of workable penalty system must be developed for contract defaulters.

Another problem which has to be overcome in the hills is one of transport. PAC has been trying to develop self sufficiency in seed, within Panchayats to overcome this. This will cut down transport costs both for the farmers and the institutions, the bulky crops such as maize and wheat being produced and stored in the Panchayats.

Working in 14 Panchayats, quality control is hard to monitor. To be self sufficient within a Panchayat there has to be several seed growers in each panchayat. This then creates problems for effective quality control work in the field. It would seem that after the initial work at PAC of identifying seed growers in all Panchayats, there should now be a change to identifying suitable panchayats in which to concentrate the seed production effort.

In the past, Pakhribas has maintained its own foundation seed, as it has always experienced difficulty in obtaining the right quality of seed, at the right time. This policy will be changing and it is hoped that foundation seed can be brought in from government stations every year, to fit into a generation system of seed production. Several bodies, though, have expressed concern as to the availability of foundation seed on a regular basis. It is therefore suggested, that a new body be set up solely to produce foundation seed. Breeders are not interested in producing it and it is not a commercial crop that is attractive to AIC business. So, as in other countries, a para-government seed development organisation should be set up to take breeder seed and multiply it to produce foundation seed. The organisation could deal with both cereal and vegetable seed.

As Nepal moves towards nation-wide seed production schemes with the flow of seed between government sources, private sources and aid projects increasing, it is essential to develop a single seed identification system for the country. It is realized that our

lot system differs from AIC and HMG(N) systems. Hence, efforts should now be made to standardise lot number construction.

It has also been the experience at PAC that it is very difficult to maintain isolation distances between cross pollinated crops, in particular maize. In the hill situation, with small land holdings, it is sometimes impossible to get the required isolation. PAC have tried several methods of getting over this obstacle. One way has been to get a group of neighbouring farmers to cooperate in seed production, to produce a large block of seed crop. The edges of the crop can always be rejected for seed if isolation is poor. Another method of achieving isolation has been to sow seed crops either before or after the main crops, thus giving isolation in time. This works in theory but it is not so effective in practice. With the wide variety of conditions in the hills, and the composite nature of the maize crops (both local and improved) flowering can occur over a long time span, negating the effect of different sowing dates. Another, more practical method of semi-isolation is to ensure that farmers near a seed crop are growing improved seed of the same cultivar from a known source. As all maize crops in the hills are composite cultivars a small percentage of out-crossing can be accepted if a strict control is kept on the number of generations allowed. This will hopefully be done at PAC if foundation seed can be supplied every year.

A problem that is now being experienced in KHARDEP ASP Panchayats is that AIC are unable to buy and store seed in the ASP buildings. They can only work out of district centres. The Panchayat level work of buying and storing seed is supposed to be carried out by the SAJHAs or an AIC agent. Even if they are present in the ASPs it is felt that

they will not have the necessary funds for proper cleaning, storage, treating and packaging of the seed in these ASPs. The only way this can be overcome is if AIC can be authorized to work outside the district centres.

FUTURE PLANS AND PROGRAM

Pakhribas Agricultural Centre is shifting away from producing seed at the Centre. In the past, foundation seed were maintained through strict control and selection measures. This is being phased out and it is hoped to use government sources for foundation seed.

SEED DEMAND AND SUPPLY SITUATION IN
NEPAL

Bharat P. Parajuli
Senior Agriculture Officer/AIC

and

Shyam K. Upadhyaya
Agriculture Officer, AIC

The collection of effective demand for improved seeds is essential for the development of a viable and self-sustaining system of seed production and distribution. The term "effective demand" in a real sense refers to the already existing demand for improved seeds among the farmers at a certain range of price during a particular period of time. In this sense the effective demand for improved seeds of a region or district may be far lower than the actual seed requirement of that place.

DEMAND CREATION

Whenever a variety is developed and released by the variety releasing committee it would be known to the farmers first through minikit program, extension workers of the DOA and through the activities of different agricultural projects. All the extension workers are supposed to be informed about this newly developed crop variety and they in turn are supposed to tell the farmers of their respective areas about it. If the farmers happen to like this new variety they would start placing demand for more seeds. Thus on the basis of the acceptability more farmers would be interested on this variety and hence there would be more demand for seeds. This is how the demand is created.

It should be noted here that the original demand creation depends much on the salesmanship of the extension workers. It is, for this reason, highly important that every extension worker should have thorough knowledge of the new variety. But, unfortunately, it has often been observed that many extension workers are not even informed of the new release for a considerable length of time. This is often the case in paddy varieties. Many field level extension workers do not know what is being developed in the research farms.

So long there is a low demand for seeds the produce of the government farms alone would be enough to meet the farmers' demand. But as the demand increases the government farms would be unable to supply seeds to meet the demand. It is at this stage that AIC is supposed to join the show. With the source seeds obtained from government farms AIC runs seed multiplication programs on farmers' fields, procures and distributes seeds to meet the demand.

DEMAND COLLECTION

Collection of reliable demand is very important while formulating future seed production program. In Nepal the organizations involved in demand collection and their methods of demand collection are as follows:

- A. Village Level:
 - a) Field level staffs of extension wing of DOA (JTs, JTAs and Agriculture Assistants)
 - b) Sajha Sansthas (Village Level Co-operatives)
- B. District Level
 - a) Agriculture branch district office (ADO)
 - b) Branch or Sub-branch Office of Agriculture Inputs Corporation (AIC)
 - c) District Agriculture Co-ordination Committee

C. Regional Level :

- a) Regional Agriculture Directorate
- b) Regional Office (AIC)
- c) Regional Seed Committee

D. Central Level:

- a) Department of Agriculture
- b) AIC Central Office

Now let us enumerate few important problems faced by AIC in the collection of improved seeds in desired quantity and quality.

1. Under the pricing system a base price for the seeds produced by seed growers would be fixed before or at the time of sowing. The prevailing market price would be considered in fixing the base price. Later on, a procurement price would be fixed few weeks before the seed collection work starts. While fixing seed procurement price the rule is that if the base price is higher than the prevailing market price in collection season then the base price itself would be the procurement price, but if the market price then is higher than the base price, the market price would be the procurement price. A premium of 10 percent for improved seeds and 15 percent for certified seeds is added to this procurement price. Rest 1-20 percent premium is paid to the farmers on the basis of analysis of seed sample. The main purpose of this policy is to give a fair price to seed growers for their produce. But the difficulties observed under this system are that if the procurement price is too much higher than the market price the farmers might bring more seeds than they have produced. It endangers seed quality and it is very difficult to check the facts as AIC has a very limited

technical manpower. On the other hand if the seed collection work is continued for a considerable length of time and if the grain price in the market shoots up the farmers would not like to give their produce to AIC. It would be difficult for a public organisation like AIC to change the decision fix new procurement price immediately at that situation. About 50 m.t. of wheat seeds was not collected at Chitwan this year simply because of the above stated reason.

2. While delivering seeds the seed growers have to deliver them at the nearest AIC office. In areas where processing plants are present the farmers are supposed to take their seeds to the plants though AIC would bear the transportation cost from AIC office to the processing plant. As the amount of seeds produced by many individual small seed growers may not be enough for a truck load those farmers would be having problems in carrying seeds from their field to the delivery point as the private truck contractors would not carry less than a truck load. AIC does not have enough number of trucks to help in that situation. In many cases the seed collection is hampered by this problem too as the farmers do not want to take much trouble unless the profit is highly attractive.
3. Drying of seeds is another major problem in the collection of seeds from seed growers. This is usually a case in maize seeds. AIC collects maize seeds from seed growers at 13 percent moisture content. But in case of summer seed production programs in hills and winter (September planting) seed production program in terai it is very difficult for the farmers to dry maize seeds up to 13 percent moisture content. Farmers do not have proper drying yard and storage facilities. In an attempt to lower moisture content many farmers have been found to deteriorate the

quality of their seeds. In areas where there are processing plants and artificial drying facilities available AIC might collect seeds from farmers upto 15-16 percent moisture but the farmers are supposed to bear the loss that would occur while drying seeds to 13 percent moisture content. But it has been observed that it would be very difficult to convince farmers that way as many of them have a feeling that they are being cheated by the Corporation. Their justification at that case is that the grain merchant in the market does not consider any moisture level.

4. Many of the seed growers of AIC are not able to make proper management of their produce. If there would be rain at the time of harvesting or threshing the seeds would get wet and be spoiled as those farmers do not have proper threshing yard and storage facilities. This problem hampered wheat seed collection in Bara, Parsa and Rupandehi district this year to a significant level.
5. Because of the processing difficulty a farmer who has already prepared his seeds may have to wait for more than a month before his turn for seed delivery comes. This problem is also discouraging many farmers.

SEED SUPPLY

The seeds collected from the seed growers and the government farms are processed and treated with protectant chemicals. They are then stored in AIC godowns till the sales season.

AIC despatches those seeds in different districts of the country keeping in view the demand of those districts. AIC is supposed to carry seeds up to the district headquarters. The seed dealers (co-operatives and in some areas, private seed dealers) are responsible in transporting seeds from district headquarter to the production areas. It should be

noted over here that AIC has no field staffs of its own to reach individual production areas and farmers. At least the manager in district AIC office would make occasional supervision and cross-check visits to the seed dealers within the district.

Considering the present situation of collection, demand and supply of improved seeds in Nepal the following measure may be recommended for making further improvement in the seed programs of the country.

RECOMMENDATION NO. 1

A successful seed program should be planned well ahead in time. A rough estimate of cropwise and varietywise quantity of improved seeds demanded by the farmers should be made at least one year before the sales season. The seed multiplication program should be formulated on the basis of that demand and the national priority and targets set by Agriculture Ministry and National Planning Commission. The Central Office of AIC should inform the ADO and AIC offices in all the districts about the seed varieties and a possible range of seed price that would be available for sale in the upcoming season.

RECOMMENDATION NO. 9

There should be a clear cut policy regarding price subsidies and production loan. These policies should be forecast before formulating seed multiplication programs. Due to sudden reduction in seed price at the sales season there would be a sudden increase in seed demand and AIC would have difficulties in supplying the required amount of seed. Wheat seed demand in Eastern Region during this wheat season is an example of this approach. While there was

a demand only for about 800-1000 m.t. of wheat seeds in that region prior to reduction in price the demand immediately rose upto 2000 m.t. as more than 30 percent reduction was made to the original seed price. Seed price eventually, was even lower than market grain price. To meet that demand AIC had to make extra collection even from flour mills. Similarly, if the loaning policy of the bank is liberal the demand would be increased and vice versa.

RECOMMENDATION NO. 10

In case of emergency if there is a need to collect ordinary seeds, the main organisation involved in quality seed business (AIC) should not be involved in this process. It has been observed that AIC is loosing faith of the farmers as it supplies such ordinary seeds too. It is usually very difficult to regain the faith once lost.

A CRITICAL LOOK AT THE SEED
DISTRIBUTION SYSTEM IN NEPAL

B.N. Kayastha, Chief
Seed Division, AIC

Seed distribution is the last major sequential step in seed production supply program. The major objective of the seed distribution program is to make available the required quantity of seed of desirable varieties in reasonable price in time for planting and producing high yields. The use of improved varieties has increased to about 20 percent of the total cultivated area of the crop in case of maize and rice and more than 80 percent in case of wheat. In Nepal, more than 90 percent of the seed used for planting are either farmer's own seed or seed from neighbors. Only a small percent of improved seed required for planting is supplied by public organizations like the Agriculture Inputs Corporation (AIC). The nationwide improved seed distribution program of AIC is controlled by the central office. In general, the AIC central office prepares a distribution chart about two months before the planting season. Regional offices and branch offices supply seed to meet the demand of the hilly remote regions. The distribution time and amount for each region depends on the total amount of seed available for the distribution. The seed made available for distribution should meet the minimum standard set for each crop. AIC distributes annually 4000 to 6000 m.t. of seed.

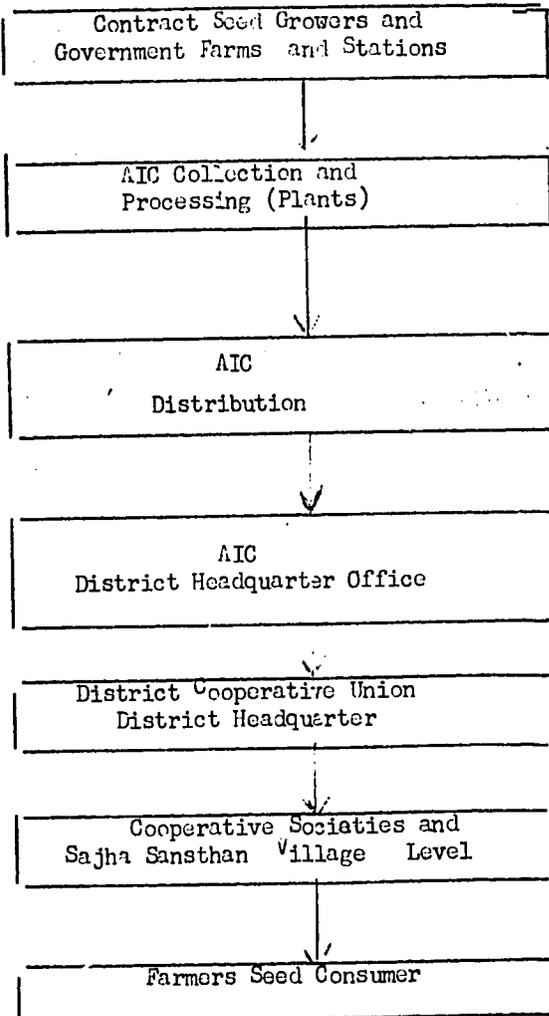
The main responsibility of improved seed distribution rests with AIC. But in practice, the distribution is only upto the district headquarters. Thereafter the responsibility is shifted to Sajha Sansthan (Coops) who are supposed to take seed from district headquarter to the farmers gate.

Sometimes these channels are unnecessarily long. District Cooperative Union's involvement is for nothing but one percent commission that it receives. Distribution from the procurement center to the district headquarter is the responsibility of AIC, under the Ministry of Agriculture where as the important phase of distribution is carried out by not too efficient cooperative unions; Sajha Sansthan, under the Ministry of Land Reform, and they are responsible for taking the improved seed to the farmers. There is a poor linkage in the channels especially because of the lack of communication and sales promotion.

AIC's seed distribution program is centralized and all the communication is through the central office. The office with the processing plant facilities act as the distribution points to the relay centers and to the outlying secondary relay centers from where the seed is distributed to the hills and remote areas (Table 2).

Figure 2

SEED DISTRIBUTION CHANNELS



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Table 2
AIC'S SEED DISTRIBUTION PROGRAM SHOWING RELAY CENTERS

Distribution Center	Relay Center	District Headquarter	Days required to transport
Itahari	Bhadrapur	Ilam Panchthar	3
Itahari	Dhankuta	Sankhuwasabha Terathum Taplejung Bhojpur	21 20 25 25
Itahari	Rajbiraj	Udaipur Khotang	10
Itahari	Lahan	Okhaldhunga Solukhumbu	8 15
Janakpur	Sindhuli	Ramechhap	7
Hetauda	Kathmandu	Dolakha	3
Hetauda	Trishuli	Rawuwa	7
Hetauda	Damauli	Manang Lamjung	15 15
Hetauda	Gajuri	Dhadingbesi	3
Bhairhawa	Taulihawa	Arghakhanchi	7
Bhairhawa	Palpa	Gulmi	7
Bhairhawa	Syanja	Parbat	7
		Baglung	15
Bhairhawa	Pokhara	Myagdi	15
Bhairhawa	Damauli	Mustang	20
		Lamjung	15
		Manang	15
Ghorahi	Pyuthan	Gorkha	3
Tulsipur	Sallyan	Rolpa	12
		Rukum	8
		Jajarkot	7
Nepalgunj	Surkhet	Dailekh	7
		Karnali Zone	25
Dhangadi	Dandeldhura	Doti	NA
		Achham	NA
		Bajura	NA
		Bajhang	NA
		Baitadi	NA

Transportation of Seed

Transportation is a big bottleneck in the process of seed distribution in Nepal. Transportation services account for a significant percentage of the total distribution cost. Transportation of seed from the producing point to the consuming centers involves several handlings and different modes of transportation.

Transportation by road is the most important method. Road transportation is mostly by trucks, the great majority of which are owned by private carriers. The Transport Corporation of Nepal (TCN) is the only public sector organization hiring out trucks.

Inefficient road infrastructure means that other more expensive forms of transport have to be used. Secondly transport is generally done by porters, animals and airways. Seeds are moved in Nepal on foot by porters, pack animals and bullock carts. Foot and cart transport are the most important methods of getting seed to the farmers. Few hill districts are totally dependent on foot transport for seed distribution. Foot transport is still of major importance for many other districts when it comes to getting seed to the farmers.

Cost Relationship Between Different Modes of Transportation

It is difficult to compare the cost relationship between the various modes of transportation because the modes and rates of transportation vary according to the topography of a particular area and the season of the year. Porters and mules serve the mountain and hills. Aircrafts are usually used to fly seeds into a remote air-strip from where it is distributed to different points by porters. Because of the much longer time taken by porters to deliver seeds, aircrafts are used for emergencies.

Transportation charges paid by AIC in different routes for different means of transportation are shown in Table 5. The transportation charge is fixed according to the distance in miles and as same for seed and fertilizer.

Table 5
SEED TRANSPORTATION CHARGES PAID BY AIC ON DIFFERENT
ROUTES FOR DIFFERENT MEANS OF TRANSPORTATION

Seed Distribution		Transport Charge Rs/m.t	No of days required
From	To		
Ilam	Panchthar	178.00	15
Biratnagar	Dharan	55.10	3
Itahari	Dharan	37.50	3
Biratnagar	Itahari	37.50	3
Biratnagar	Bhadrapur	68.00	3
Biratnagar	Rajbiraj	79.80	3
Biratnagar	Janakpur	214.00	3
Dharan	Taplejung	5193.00	25
Dharan	Terathum	2150.00	20
Dharan	Chainpur	3150.00	10
Dharan	Khandbari	3100.00	21
Dharan	Dhankuta	325.50	15
Dharan	Bhojpur	2810.00	25
Rajbiraj	Diktel	2320.00	10

Table 6

TRANSPORTATION CHARGES ARE FIXED ACCORDING TO THE
DISTANCE IN KILOMETERS WITH ADDED PERCENTAGE FOR
SHORT DISTANCE

Route	Distance Km	Rate per Km (Rs.)	Additional percentage	Rate per m.t.
Bhairhawa to Tansen	61	0.972	75	103.76
Bhairhawa to Aryabhanjyang	98	0.972	40	133.36
Bhairhawa to Garlyang	98	0.972	35	128.60
Bhairhawa to Waling	116	0.972	30	146.58
Bhairhawa to Syang ja	142	0.972	25	172.52
Bhairhawa to Naudanda	151	0.972	25	183.46
Bhairhawa to Damauli	224	0.972	10	239.50
Bhairhawa to Pokhara	175	0.972	25	213.84
Bhairhawa to Majuwakhaireni	259	0.972	10	276.92
Bhairhawa to Kathmandu	376	0.972	-	365.47
Bhairhawa to Taulihawa	49	0.972	20	57.15
Bhairhawa to Taulihawa	50	0.972	125	109.35
Bhairhawa to Krishnanagar	108	0.972	-	104.98

Recommendation VI

Foundation seeds are produced in government farms mostly in the terai REGION. These seeds have to be transported to certified seed multiplication areas which are found mostly in the terai and some in the hill remote sites. Foundation seeds should be transported not only in time but also at a reasonable price. We are not in favour of subsidies in general but until the supply and demand factors influence the seed market in the Hills transport subsidies for foundation seeds should be continued.

Recommendation VII

Air transportation of seed is done only in a emergency cases. But air transportation may turn out to be less expensive than porters for longer distances. Besides, in certain remote areas such as Humla, Mugu, and Dolpa air transportation is probably the best mode of transport and should be used. However for shorter distance for which porters are easily available portering may be less expensive than air-lifting.

Air transport of seeds in the remote hills where air strips exist is so far limited due to the shortage of air crafts with RNAC. Plans should be prepared to utilize some of its aircrafts for chartering cargo goods consisting mainly of seeds to the mountain and hill districts.

Recommendation VIII

Quality loss during transportation is generally believed to be low but it has been reported to be quite high on some occasions. This loss could be reduced by improving the bag quality and bag size according to the need of porters as well as consumer farmers.

Table 10

A COMPARISON BETWEEN THE AIR TRANSPORTATION COST
AND THE COST OF PORTERING IN 1978-1979

Aeroplane	Capacity	Cost of transportation
Twin Otters	1.5 m.t.	Rs. 10/m.t./km
Pilatus Porters	0.5 m.t.	Rs. 16/m.t./Km
Porter	0.05 m.t.	Rs. 15.63/m.t./Km

Source: Department of Civil Aviation.

Note: The cost of per hour operation of Twin Otters (DHC-6)=Rs.3250.
The cost of per hour operation of Pilatus Porter (PC-6)=Rs.1820.
Thus the Civil Aviation Department comparison shows that it is cheaper to use Twin Otters but costlier to use Pilatus Porter when compared with human porters.

PLANNING FOR SEED BUSINESS
IN NEPAL

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Agriculture Officer
AIC

Seed business in Nepal is still at an embryonic stage. Until now there is a very little participation of private sector enterprises in this business. In public sector too, Agriculture Inputs Corporation (AIC) is the only agency engaged in production, procurement and distribution of improved seeds in the country. Besides seeds AIC deals also with other agricultural inputs like fertilizer, agricultural chemicals and tools. To be more explicit, seed constitutes a very small part of total business volume of AIC. To add further the role of AIC is limited only to the handling of seeds of three major cereals crops (paddy, maize and wheat) and few vegetable crops. A review of statistics of seed sales through an institutional source for the last 16 years shows that the average annual sale of paddy, maize and wheat seeds are 247, 82 and 1334 m.t. respectively. AIC sold about 218 m.t. of wheat seed during the fiscal year 1981-82 which would cover only 5.54 percent of the total area of 399890 hectares under wheat cultivation. Similarly, the amounts of paddy and maize seeds sold during 1981-82 are about 243 mt and 134 m.t. which would cover only about 0.37 percent and 1.4 percent of total area under paddy and maize respectively. The amount of vegetable seeds sold by AIC during that year was 8.5 m.t. Though various agricultural projects working inside the country and some government farms are playing a supplementary role in the dissemination of improved seeds the total acreage covered by improved seeds in Nepal is still unsatisfactory. I would, thus, be clear that there is a bright scope for an emerging seed industry in Nepal even without thinking of export market.

Visualizing such an enormous prospect of a seed industry one might be curious to know why the private investors are not interested in this business yet and why the existing public corporation is not able to produce and distribute targeted amount of improved seeds.

Private Sector

The reality of inadequate supply and the consumption potentiality of improved seeds has been explained. An analysis of the seeds offered for sale by AIC, the amount actually sold and the amount left unsold indicates that inadequate supply, is limited with lack of demand for improved seeds (Table 2). Out of about 3345 m.t. of wheat and 300 m.t. of maize seeds offered for sale during 1981-82 only about 2218 m.t. of wheat and 135 m.t. of maize seeds were sold. The amounts of wheat and maize seeds which were left unsold at the end of their sales seasons are about 320 m.t. and 78 m.t. respectively. According to statistics collected from 30 out of 63 AIC offices a total of about 457 m.t. of wheat seeds, 14.2 m.t. of paddy 1.30 m.t. of maize and 3.5 m.t. of vegetable seeds were damped by those offices during FY 1982-83.

This clearly indicates that although the amount of improved seeds supplied by AIC was far short of the targeted amount, it still was adequate to meet the existing demand of the Nepalese farmers. A common reason attributed to this state of poor demand is the poor quality of seeds produced by AIC. This might be partly true, but this could not be the sole reason. The experience of this year on the demand of wheat seed could be cited as a testimony for the above statement. While there was only a moderate demand for wheat seeds prior to the reduction in seed price the demand showed a dramatic rise immediately after the price was reduced. The farmers were clamouring to buy even the ordinary quality wheat seeds collected from flour mills and grain market. Moreover, the demand was greatest (30 percent) in the eastern region where higher discount was given on seed price. This proves that our farmers are more conscious of seed price rather than of seed quality.

A strategy for the development of a viable seed industry in Nepal could be as below:

1. A strong seed division in AIC with competent technical manpower and authority is of vital importance. This seed division would monitor all the seed program in the country. The seed division of AIC should be strengthened for this reason. It should have specialized units for production, processing, storage, quality control, planning and coordination. The seed division should plan seed program and should have the authority to recommend facilities needed to run such program. The national target set by National Planning Commission and the Ministry should be the basic guideline while formulating seed program. Separate budget should be allocated for running the seed program. The AIC should also coordinate the seed production activities of other agencies like different agricultural project, private enterprises, government farms etc.
2. Private sectors should be encouraged to participate in seed business. The role of seed division should be complementary rather than competitive to the private enterprises. At the present stage, the handling of bulky seeds like paddy, wheat and maize (composite varieties) may not be attractive for a private entrepreneur. Private entrepreneur's participation may be expected in case of vegetable seed production and to some extent, production of hybrid maize seed. However, the activities of private enterprises should be guided by AIC.
3. Seed certification and overall quality check both in private and public sectors, should be done by an independent certifying agency. But the organization which produces and distributes seeds should itself be responsible for the maintenance of its seed quality. The Agriculture Botany Section should have adequate manpower so as to make timely inspection of the seed production plots.

4. Seed production program should be concentrated in areas where there are already established processing and storage facilities and in new areas where they are needed most.
5. Regular servicing of processing plants should be made and the spare parts should be available in time.

The corn cob drier at Hetauda seed processing plant should be repaired. All other seed plants except the Hetauda seed processing plant have no precleaning facilities. Precleaners may be added on those plants. Premium should be paid to the seed growers on the basis of their unprocessed seed sample. Small scale solar drier system may be introduced for drying maize seeds. Provision of regular training should be made to the mechanics and plant operators working on seed plants.

6. Seed storage godowns should be constructed at the seed processing centers and at the major relay centers. Larger godowns are needed at Itahari, Hetauda, Janakpur, Bhairahawa and Nepalgunj. Godowns should also be constructed at major seed distribution points like Dhangadi, Surkhet, Bang, Palpa, Syangja, Pokhara, Damauli, Dhankuta, Rajbiraj and Bhadrapur, it has been found that germination drop in maize seed is better checked if the maize seeds are stored in cool places like Daman. Hence it is necessary to explore such centers in every region and construct godowns there. Fumigation sheets and other storage accessories should be made available in time. Researches may have to be undertaken on developing more suitable bags for pecking seeds.

7. There should be clear cut policies regarding price subsidies so that private entrepreneurs should not suffer. Effective demand collection procedures should be developed. AIC should forecast a reasonable range of seed varieties that would be available for sale at least six months ahead of the sowing season. Reliable demand should be collected and reported to the concerned channels well ahead in time.
8. A reasonable buffer stock may have to be maintained in order to meet possible shortage in emergency. Such buffer stocks should be properly stored at the major seed relay centers.
9. It is clear that no organization will succeed in its business unless its employees work to their best. The test of good management depends on how much it can exploit out of its employees. In order to take most out of any employee he should be assured that the organization cares for him. It has often been seen that the technicians in AIC feel somewhat alienated in their own organization. A basic conflict of values is seen between them and the management officials. It is very essential to eradicate this sort of feelings for successful management.

Seed component in AIC differs from other components in that seed business, actually, is a sort of industry and not simple trading. The growth of an industry is always difficult than a trading business. But seed industry is a must for the development of the country.

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SEED PRODUCTION ACTIVITIES IN IHDP

M.D. Bhatt and
J.S. Gaudin

vii. Pricing and marketing procedures:

The price for each crop is fixed in the District Agricultural Committee. Farmers representatives from as many of the producing regions as possible are invited to attend.

The seed we produce is sold through the ADO to the farmers, very often through the intermediary of the Tukis, leader farmers trained by the project.

Pricing both for selling seed and for distribution to farmers is made difficult because of the lack of direction we get from the center. Our policy is to keep our prices as much as possible in line with those of the AIC. We find that our biggest problem is not so much the price difference, although prices have risen sharply over the last two years. The main problem is that the price is never known early enough. It is very difficult to get a realistic demand from farmers if they do not know how much they will have to pay. There should be a long term pricing policy which would give confidence to administrators of seed and extension programs as well as farmers. Yearly prices for the particular crops should be fixed at least 2 months ahead of the earliest sowing date.

Furthermore, there appears to be a move to establish zonal or even nationwide prices. This will only lead to anomalies in the seed production of a country like Nepal, which is agriculturally so widely diversified. This tendency could seriously affect seed production in the hills which has other reasons for its existence than pure economics.

4. Experiences

Our experience with seed production programs in the last 5 years has lead us to a number of conclusions:

- a. It is not easy to distinguish a good seed growing area at first sight. There must be a good area of Khet or Bari land and farmers must be above the subsistence level. Persistence is needed over several years to seed if farmers respond to a seed production program. This persistence is also appreciated by the farmers, who gain confidence that their crop will be bought at a fair price.
- b. In potato seed production it is most important that the farmers live near their fields, and that they do not have too many animals. In most lekh areas the potato fields are several hours walk away from the village and during the summer most of the household is away grazing their animals in the high pasture lands.
- c. Farmers can be very hard bargainers and will bluff upto the last minute in any negotiations. On the other hand most seed program administrators have targets to achieve and are tempted to relax their conditions or raise their prices. The best answer we have found is careful preparation before any meeting. If an official is sure of his facts and offers a fair deal it will not often be refused. The only problem is that a lot of time is needed for such negotiations.
- d. Once a farmer has crop seed for sale a major incentive of a program can offer is payment in cash. Apart from exceptional cases, food grains can only be sold in the village in small quantities and very often only on credit. The recognition of this fact can contribute a lot to the smooth running of a seed program.

5. Future Plans

In the future our seed production programs in Dolakha will be taken over by the AIC. A store cum treatment center has nearly been completed and a JT from the ADO's office has been appointed as In-charge. The program will be run in conjunction with the ADO whose JTAs in the program area will do most of the crop inspection and harvest supervision.

6. The role of IHDP will be first and foremost to ensure the smooth running of the established program by technical support to the ADO and trainings for farmers and field staff. Efforts will be made to develop the farmers in various areas into groups that could eventually supervise their own crop quality and marketing.

Besides this, efforts will be made to develop seed multiplication programs in minor crops such as millet and soyabean.

SEED PRICING, SUBSIDY AND RELATED ISSUES

B.N. Kayastha
Chief, Seed Division
AIC

It is sometimes said that one of the reasons as to why a limited number of farmers use AIC seeds is that the seed price is much higher than the local grain price. This feeling may be true in some areas where an awareness about the value of good seed and new varieties is behind schedule because of weak extension service. A good quality seed certainly pays rich dividends and it is definitely going to be a little more expensive than ordinary grain. However, the price of the seed has to be kept down so that farmers may afford to buy when they are convinced of the value of the high yielding seeds. A price policy aimed to balance the economic interest of seed producers and farmers consumers has to reconcile two conflicting interests. A satisfactory price to the seed producer would generally mean a higher cost to the seed consumer, while a satisfactory price for the seed consumer may become a lower return to the seed producer.

Objectives of Seed Price Policy

1. to increase the consumption of seed,
2. to allow sale agents a reasonable profit margin to enable and encourage them to provide effective sales promotion and services
3. to provide improved seed in adequate quantities.

The demand for the improved seed is ever increasing. To meet the demand an effective production system has to be developed. Seed growers are selected and are asked to use foundation seed and other inputs to have quality seed produced. Obviously, their product should cover their increased costs and leave some profit. Therefore as recommended by the Central Seed Production Committee, AIC fixes the base price in advance for the seed growers. It is fixed at least a month before the planting season. For example, in terai the base price for wheat seed growers is fixed in second week of Aswin (September) and also the same time for the winter maize seed growers. This ensures a minimum price of their product. This has encouraged more farmers to participate as contract seed growers and it has also encouraged the seed growers to use recommended inputs and improved cultural practices.

In order to reduce the field supervision cost and to ensure proper utilization of limited manpower AIC is trying to concentrate seed production program in compact blocks or in a few selected pockets. These pockets should be the potential good cultivated area of the region. The base price fixation system facilitates to develop pocket areas for seed production program and it also encourages all the farmers of the pocket area to participate in the seed production campaign.

The seed produced by the seed growers should be collected in time for both quality control and timely availability. Adequate arrangement must be made to procure the seed in time. This will involve some price incentive. If the base price fixed before planting is same or higher than the local market prices at the time of seed procurement (collection) then the incentive provided by the base price will be enough. But if the market price at the time of collection is higher than the base price fixed, a new price has to be fixed, as collection price at the time of seed collection. For example, in terai this price for wheat is fixed in first week of Baishakh (April) if necessary. This helps in seed collection.

Who fixes the base price as well as the collection price ? These prices are fixed by the committee of managers from the AIC and ADB and two representative farmers. The local ADO chairs the committee and fixes the price. On top of this collection price, improved seed growers are entitled to receive 10 percent premium as the first installment and may later get upto 20 percent premium on the basis of quality seed produced. For certified seed growers the first installment of premium is 15 percent. This could be higher upto 20 percent for foundation seed growers. The second 20 percent premium is calculated on the basis of seed laboratory test results as shown in Table 1 and 2.

The third part of incentive is to arrange processing and storage facilities. Processing of seed has to be done immediately at the time when the farmers bring seed to the processing plant. All seeds should be processed before rainy season. This may end up in running two or three shifts per day. Here beside the processing cost and other logistics, depreciation charges of the seed plant equipment and their maintenance cost must be considered. The storage facilities for the unprocessed seed as well as for the processed seed have to be adequately arranged. Dependence on hiring private godowns and buildings to meet storage requirements leads to losses in seed quality. Majority of the hired godowns are usually of poor and substandard quality. The rents paid are also high for the poor storage space mainly because of urgent hiring usually during peak seasonal demand for storage capacity.

Seed Pricing System of AIC (Table 3) (shown in text)

Production cost

1. Procurement cost: This cost includes base price or collection price and premium percentage given to the seed growers according to their seed quality. This will also include loading and unloading.

2. Processing cost: This cost will include labour, electricity agropesticides used to treat the seed and seed packaging material. At present the depreciation cost and maintenance cost of the equipments are not included in the processing cost.
3. Storage cost: No storage cost or maintenance is added in seed by AIC.

In this margin control pricing policy the prices vary from area to area reflecting differences in costs, primarily transportation. Margin control pricing policy has the following advantages. (1) It ensures fair prices of seed (2) Seed demand increases in areas where returns are greatest (3) It avoids the problems in setting the best uniform price. Disadvantages include different prices of a crop seed in a district according to the lot receive from other AIC offices. Checking is difficult because the sellers are allowed the change from place to place. The real danger is that margin set may either be too low and discourage sales. This procedure appears superior to other alternatives if margin controls are set wisely with sufficient emphasis on encouraging sales as well as a fair price to the consumer. The margins for both wholesalers and retailers should be based on costs incurred. Retail margins should also be based on costs incurred to the point of delivery at the retail godown.

It is recommended that the AIC should also be the logical authority to police price margin regulations and quality control. AIC personnel should constantly spot check the retailers of the area. The suggested number is ten retailers per person. Samples of products being sold should be collected on spot check basis and analyzed to detect adulteration. Weights and measures would also be examined for accuracy. Demand and supply of seed should also be controlled by AIC field staff on a spot checking basis.

Alternative Pricing Policies

Fixed uniform price:

The policy of charging a fixed price for seed, uniform throughout the country, was tried with maize seed in 1982-83. The price was fixed to cover costs of production and distribution. The chief advantage in fixing prices at uniform levels is encouraging seed use equally throughout the country. The price is known and easier to deal and uniform. The chief disadvantage is that the use of seed is reduced in the potential areas of terai.

No control price:

The private companies or institutions involved in seed activities are given complete freedom to set their prices. This policy is superior in bringing about increases in sales and consumption. The advantages of such a policy are that the sellers are able to charge prices that provide attractive profits. The sellers will try to expand sales by using sales promotion and servicing technique.

Price subsidy:

A program for public sector foodgrain distribution at subsidized prices is implemented by Nepal Food Corporation. The volume distributed has been increasing steadily. Distribution prices are heavily subsidized with the largest subsidy being paid for the remote hills sector. The subsidy rate on selling price ranges from 57 percent for Kathmandu to 96 per cent for the lower Hills and 142 percent for the mountain and remote hills. For the remote hills, therefore, NFC selling price does not even cover the cost of transporting the foodgrains. It should be assumed that the remote districts have the lowest productivity and the lowest capacity to purchase seeds. The remote areas need to have much higher subsidy element in the price.

Seed use can be increased tremendously by subsidizing prices. The most recent evidence of the effectiveness of a large subsidy was observed in the case of wheat seed sale in the Eastern Development Region in 1982-83.

Transportation from the district headquarter to the interior villages is costly because of lack of good roads. Transport subsidy from district headquarters to remote interiors may help in penetration of the dealers inside the villages.

Credit Facilities:

Farmers purchase improved seed through the cooperatives either on cash or on credit and the cooperatives get a 5 percent commission. Agriculture Development Bank (ADB) and cooperative Sajha are the two institutions providing agricultural credit to the farmers. Funds are reported to be sufficient for loans to farmers for seed production. But few farmers complain on complexity of the procedure. ADB should be requested to provide storage loans or seed industry loan to the seed grower-marketing groups of farmers and private seed entrepreneurs. A mini-metal bin program initiated by ADOs in some districts should be considered for storage loan. The amounts they individually need are of course small but this does not make their need less urgent.

Now the question is "can seed be sold at a price level that will ensure suitable incentives? One of the ways to reduce the cost of production is to increase the efficiencies in procurement and processing. Transportation cost could be minimized by developing regional self-sufficiency.

Field inspection cost and collection cost can be reduced to an extent by concentrating the seed production area in a pocket or two. Timely procurement of equipment and spare parts, bags, agro-pesticides, and maintainance of the efficiency of processing plants will reduce the cost. Building seed warehouses at strategic points will certainly reduce the cost of the seed and preserve the quality. Seeds have got to be transported and stored until the planting season leading to heavy storage cost. By rough calculation, AIC rented godown cost accounts for more than 2 percent of the selling price. This cost could be reduced by building warehouses at strategic points. Construction of storage facilities for dealers must also be considered.

Initially however transportation costs and other factors should not limit seed use. Subsidy on transport for more remote areas should be considered. Government must insure the availability of a large quantity of seeds along with effective extension services. Finally I will stress that pricing should be related to the local situation.

QUALITY ASSURANCE PROGRAM WITHIN A
SEED ENTERPRISE

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Internal Quality Control

And maintaining good seed quality through all these steps requires knowledgeable and dedicated persons. Thus, leaving the concern for seed quality to one person or one organization only becomes a serious mistake. It must pervade every aspect of seed program. Especially the seed enterprises (in this context AIC) that emphasize seed quality in their activities should not be without their own quality control system. Since the success or the failure of a seed enterprise is dependent so much on the quality of seed it supplies and since the intricate nature of seed business which takes years to build reputation but takes only one season of bad seed supply to lose the reputation, the need for a quality control program within the seed enterprise cannot but be exaggerated. Self-control by a seed enterprise is the first line of defence against bad seed supply and the first line of defence can work only by a regular quality control program of its own.

And, obviously, a quality control program is meaningless unless it is backed by reliable seed testing and analysis.

At this point I feel it is worthwhile to try to draw a line of demarcation between what is called the official or formal quality control program and the quality assurance program (quality control within the seed enterprise) lest we might misunderstand it as one and same thing.

The official or the formal quality control program which is usually implemented by official seed certification, seed testing and seed law enforcement is existent in most every seed program of the world in some form or the other. The kind of quality control program that I am going to outline in this paper is, however, different; it is about the internal control within AIC.

Some Measures for Consideration

1. AIC field staff and Agriculture Botany Section field staff should be well-acquainted about a crop variety to be multiplied. This will facilitate seed field inspections and certification. This is very important because a variety bred is a plant breeder's baby and he or she best knows how he or she bred it.
2. In major seed production/processing centres of AIC in terai, the existing technical manpower is not adequate for the kind and amount of work to be handled. Nor are the physical facilities adequate for the same. In a situation like this expecting results from the AIC technicians for the quality of seed they produce, receive, process, package and distribute is almost impossible.
3. The official certification tag is good only for one season and when seed is stored under proper storage conditions. The term "proper storage conditions" is vague and irrelevant unless those conditions are actually created. In the normal course, unless the seed stored is infested with insects prior to the validity period of the quality tag, most AIC technicians have tendency to go ahead and distribute the seed to the farmers taking the quality for granted. But insect infestation is not the only cause of seed quality deterioration and a lot of other factors are also responsible. However, if AIC technicians are fully made responsible for the quality of seed they supply with their own quality assurance program, in conjunction with the official quality control tag, some of the present seed quality problems can be checked to the large extent.

4. For any seed enterprise, proper seed lot identification so as to be able to retrace the history of the seed lot is very essential. The managers of a seed enterprises should have a sound basis as to which seed lots to be distributed first and which seed lots to be carried over. AIC should establish proper procedures in this regard.
5. Varietal mixture is something which cannot be detected, reliably by the laboratory testing of seed(except for few crops, and that too with spohisticated testing equipment).
6. As regards receiving of field inspected seed at seed processing plants, some reliable means to test the germination of seed should be introduced prior to receiving of the seed. This can be done by quick viability test, such as tetrazolium test which AIC staff should be able to perform.
7. In order to avoid delay in paying of premium to the seed growers, they should be paid premium based upon the quality of raw seed they have delivered and not upon the quality of their processed seed. Because in the later case the premium the seed grower gets is based largely on the efficiency of seed processing.
8. Seed smaples for testing for fixation and paying of premium need not necessarily be sent to the official seed testing laboratory. Instead AIC's internal quality control program should be made responsible for it. The quality tag of the official seed testing laboratory is going to be there any way, once the seed is processed and ready for distribution.
9. Another area whore AIC's internal quality control activities should be strenghtened is in the seed processing plants. Seed

processing is not just running of seed through some pieces of seed processing machines. Seed processing can upgrade or degrade the quality of the same lot of seed depending upon its efficiency. Besides giving due care to cleanliness and sanitation of seed processing machines so as to avoid mechanical admixtures, a seed processor has got to be careful not to inflict mechanical and heat damage during seed processing, handling and drying. These are all part of an internal quality control program within a seed enterprise.

10. The last but not the least area where the quality assurance program of AIC should concentrate is on Sajha co-operative warehouses. Sajha co-operatives are the grass root level distributors of AIC seed. The seed remains quite for some time in their warehouses before it finally reaches the farmer. But the Sajha co-operatives often do not have adequate warehouse spaces to store seed as it should be stored. As a result seed, fertilizer, insecticide fungicide, are all stored in the same place. Moreover, Sajha cooperatives do not have necessary technical man power to handle seed safely. Thus a part of AIC's concern for quality assurance program should be improvement of Sajha seed stores. The Sajha managers/or storekeepers should be well educated by way of special trainings on seed handling, seed storage management and seed marketing.
11. Let me once again stress the need of reputation for a seed enterprise as a supplier of quality seed if it is to remain in seed business. For good reputation, AIC should deal only with the supply of certified seed whose genetic, physical and physiological quality is assured and should avoid handling of uncertified seeds. Even at the time of acute shortages, AIC should not come into picture for the distribution and supply of grain seed (grain seed collected from grain farmers and warehouses). In a situation

like this, some other non-seed organization such as Nepal Food Corporation, Salt Trading Corporations etc. might be asked to distribute grain seed with truthfulness in labelling. The dealing of the so-called Improved seed (Yellow tag) by AIC may be necessary for a while but the quality of the improved seed should be assured if not officially certified.

Finally the present AIC seed set up (both manpower wise as well as physical facility wise) is not adequate for the kind of job it is to do. Thus, timely thought might be given to whether the present AIC seed set up itself is to be strengthened or a subsidiary organization for seed under AIC management is to be created or an all together new organization is to be set up exclusively for seed.

INCREASING THE USE OF HYV SEEDS IN NEPAL
IMPLICATIONS FOR MARKETING AND PRICING POLICIES

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Marketing Policy

AIC is the only institutional source involved in the marketing of HYV seeds in Nepal. It procures seeds from the appointed contract seed growers, from the government farms and, if necessary, from abroad. Over time, the dependence of AIC for HYV seed procurement from the contract growers has increased. AIC supplies HYV foundation seeds and other necessary complementary inputs to the contract growers. The output (seed) is procured by AIC at pre-negotiated price. After the test of the quality of seed, the growers are paid premium prices depending on quality. It is reported that the prices received by seed growers are higher than the prices of ordinary grains. The cost of cultivation of seed, on the other hand is said to be higher by 10 to 20 percent. The inputs needed in seed production is supplied by AIC on credit, deductible at the time of seed procurement by AIC. If AIC requires HYV seeds in large amounts at an increasing rate over time, more and more contract farmers will have to be contracted for seed production. This, obviously, requires that production of seed crop be remunerative compared to the production of ordinary grains. This can, however, be done either by increasing the prices of seeds to be procured or by the supply of complementary inputs at lower prices or with a mix of both. On the other hand, farmers owning large holdings will have to be contracted as technical know-how and irrigated land, generally, belongs to these farmers. Also that such farmers can set aside land for seed production previously used to produce surplus grains for sale. Even if remunerative, small land holders may not be able to spare land for

the purpose as they would first ensure the supply of foodgrains for consumption.

AIC processes the seeds procured from the contract growers in five plants located in terai. The seed then is supplied to the farmers through AIC field offices. Hills and mountains get seed supplied from terai. However, the Seed Production and Input Storage Project envisages to establish seed processing plants also in 25 hill districts. If this is accomplished, hill areas will be able to get seeds that have been produced within the hills. This will reduce both the magnitude of transportation subsidy and will make the task of seed distribution more smooth. Production in the hills itself is also expected to increase the environmental adaptability of seeds and reduce susceptibility to local diseases.

Optimally, HYV seeds should be produced in all leading production pockets in hills and mountains and in terai so as to make distribution of HYV seeds smooth. Such a production scheme will also enhance substitution of HYV seeds for local variety seeds that moves from farmers to farmers. AIC can appoint contract growers, provide technical back-stopping, and procure enough seed for its own distribution program and at the same time encourage farm-to-farm distribution too.

Marketing of seeds through non-institutional sources is traditional and customary. Generally farmers save seed from their own produced grains. Other sources of seed supply are through borrowing or through exchange. These, essentially, are limited to a narrow periphery of the area where the seed is produced. In the terai, HYV seeds spill over from across the Indian border too. Local traders and merchants bring HYV seeds from India and sell in local weekly and bi-weekly markets. Such practices are widespread specially in the case of wheat and maize.

Easy availability of HYV seeds is a fundamental requirement for increasing adoption. Existing marketing channels of AIC do not seem to be adequate as distribution or sales are limited to easily accessible areas to the district headquarter. The peripheral area under each sales depot is necessarily narrow specially in the hills. Beyond the periphery, transaction cost in terms of transportation can be prohibitively high. This limits the use of HYV seeds to only a limited area. For the widespread use of HYV seeds, delivery mechanism should be rationalized and delivery centres increased in number. For this, again, transaction of HYV seeds from farmers to farmers needs to be encouraged.

Pricing Policy

In Nepalese agriculture use of purchased inputs is insignificant. CBS (1978) reports that the proportion of purchased inputs in total inputs used is 5 percent in case of paddy, 2 percent in case of maize and 12 percent in case of wheat. This reveals the underdeveloped nature of inputs-market in Nepal. In fact, in subsistence and traditional agriculture all inputs including seed is provided from within the household. The same study reports that value of seeds constitutes a very low proportion of the total value of inputs used in production of paddy (15.4 percent), maize (4.4 percent) and wheat (12.2 percent). The value of seed is the imputed value as farmers, largely, use own produced seeds.

Prices of seeds supplied through non-institutional sources are determined by market forces. It has been found that seed obtained on credit are charged interest rates as high as 100 percent. Borrowers pay in grains after the harvest when the prices are low. However, borrowing is made when the prices of ordinary grains are also high. This reduces the effective rate of interest giving an indication that

prices of ordinary grains. There is, however, no information available which indicates the actual prices of locally traded seeds.

Transaction of HYV seeds supplied through institutional sources is in money terms. Farmers are required to pay in cash for the seeds. AIC fixes prices of HYV seed on a mark-up basis, which includes all expenses incurred till the seed reaches the farmers. Government subsidizes the transportation cost and often directs to fix prices substantially below the mark-up prices reached by AIC. In such cases AIC supplies seed at less than mark-up prices and recovers the loss from the government.

There is a widespread belief that lower prices of modern inputs including HYV seed encourage the adoption of such inputs. However, Nepal's experience in sales of HYV seed is not such encouraging. In spite of substantial subsidization, distribution of HYV seed from AIC has remained almost stagnant since the last decade. In absolute terms, wheat area seems to respond favourably but this is probably because wheat is a new crop in Nepal. Every addition in area under wheat is found adopting HYV seed. For paddy and maize, rate of increase of area under HYV seed is negligible. Existing data on area under HYV seeds, however, do not fully reflect the proper use of improved seeds. One rough estimate made by ADB/Manila indicates that even the widely used figures for area under HYV seed is doubtful. Relating the annual off-take of HYV seed to the area under HYV, the estimate is that farmers replace paddy seeds every 50 years, maize seed every 10 years and wheat seeds every 17 years. If the estimate is approximated as true, the extent of use of HYV seed is at doubt. This in turn raises question whether prices play significant role in decision process of the farmers to adopt HYV seeds.

It is argued here that level of prices may not be of much importance in the special circumstances, that prevail in Nepal. Nepal's rural economy is only partially monetized and level of monetization is yet low. Average farmers earn very little cash income which is spent on procuring necessities. Hence, little is left for obtaining inputs involving cash transaction. Probably because of this, average farmers buy less of HYV seeds and rely on seeds saved personally or procured locally (without involving money).

If prices of seed matter at all, it may not be the apparent prices set by AIC, but may be the actual prices the farmers have to pay to obtain the seed. In the actual prices, premium for risk is very important. Instances of failure of HYV seeds in augmenting yield are rampant. If yield reduces substantially after the use of HYV seeds - be it in the farmers' own field or in his neighbours or if he happens to learn of it somehow, the farmer will avoid the use of it, as its use may put his survival at stake. As farmers in general and subsistence farmers in particular area necessarily most averse to risk, it will be increasingly painful to the farmers to substitute HYV seeds for own produced seeds which are long tested and which are well adapted to local conditions.

But then, should there be no pricing policy for HYV seeds? Of course there should be one. If AIC fixes prices below the prices of locally produced and available seeds or that of ordinary grains, HYV seeds may be put into alternative uses. If AIC fixes prices at a higher level, few will purchase them and the phenomenon of using local seeds will continue. It is argued that AIC should fix money prices of seed not only considering the prices of ordinary grains but also should attempt to develop a mechanism in which non-monetary pricing is possible. Seeds can be exchanged for ordinary grains; ordinary grains then can be sold locally or to Nepal Food Corporation, for example. This will encourage the farmers who are, with the exception of a few,

essentially non-cash income earners, to adopt HYV seeds. This can be achieved by AIC itself and/or through Sajha. The present practice of appointing contract growers may be multiplied so that every Panchayat will eventually contain contract growers who will act as local supplier of seeds under flexible terms and conditions. However, technical considerations that third or fifth generation of HYV seed is no longer of HYV, and that HYV seeds are effective only when used with complementary inputs and so on, will have to be brought to the knowledge of farmers. Changes in farmers attitude and perceptions in favour of HYV seed, are of course prerequisites for increased use of improved variety of seeds in general.