Production and Marketing of Sissoo:
A Case Study of Dhanusa

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INTRODUCTION

The Forest Act 1993 classifies the forests of Nepal into two broad ownership classes: the Private and the National Forests. In the private forests, the land and the trees on which they stand are owned by individuals or corporate bodies. In other words, the land and the trees are owned the same entities. In the national forests, the land on which the trees stand is always owned by the government, but the trees can be owned by communities, commercial enterprises, religious bodies or even by government itself.

This paper is confined to the cultivation and marketing of Sissoo trees as private forests in the terai region, more particularly in the Dhanusa district of Nepal. One hypothesis of this paper is that we need not worry so much about the deforestation in terai of Nepal provided appropriate policy signals and instruments are in order. There are empirical evidences to support that if the National forests of the terai are deforested and degraded, farmers and peasants will plant more trees in their farming land. In other words, there appears to be some substitution between the national and the private forests trees in the terai of Nepal.

SUBSTITUTION BETWEEN NATIONAL AND PRIVATE FORESTS

Recently, Forest Survey and Statistical Division (FSSD) of the Ministry of Forests and Soil Conservation has produced a compilation of the status of the national forests in the 20 districts of the terai (FSSD, 1993). Similarly, Central Bureau of Statistics (CBS) has completed agriculture survey of Nepal in 1991/92, and is in the process of publishing the reports for all he 75 districts (CBS, 1993). CBS has also provided the preliminary population census data for all the districts of Nepal (CB$, 1992). Based on these estimates, a comparison is made to see the interrelationship between the number of private forest trees, and the extent of national forests in the terai districts of Nepal. Since most of these trees planted in the farm land are scattered, CBS has counted the number of such forest trees. We regressed the number of forest trees per unit of agriculture area (Y) with the area of national forests per capita (X), and it was

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found that they are significantly related to each other. The regression equation is reproduced below:

Y	= 10.01279 - 21.8231 X
Standard error of Y estimate	= 3.293329
R squared	= 0.42943
Number of observation	= 20
Standard error of coefficient	= 5.929
t value	= - 3.6807

The relationship indicates that if the area of national forests per capita is reduced, private tree planting in the farmland would significantly increase. This can also be interpreted as the impact of induced innovation in forest management. Once the national and natural forests are depleted, the scarcity (increased real price of woody product) will provide incentives to cultivate more valuable trees. We can visually observe this phenomena in Dhanusa district as well, where some of rich landlords are switching their land use from annual crops to pure Sissoo plantations.

SISSOO CULTIVATION IN DHANUSA

In a separate study, we interviewed 232 households through stratified random sampling, of Dhanusa district so as to know the pattern of Sissoo plantation in private land, which is always used to grow agriculture crops. These households had about 42 thousand private trees (42 species were identified) in their farming land, and 80 percent of them were Sissoo trees. Within the last 8 years the families has planted/nurtured about 83 thousand seedlings, out of which only 28.6 thousands had survived, and 91 percent of those survived were Sissoo. The predominant pattern of Sissoo plantation was along the bund of agriculture field, followed by planting in blocks, homesteads, scattered planting and along the periphery of fish ponds.

Almost all of the farmers have their own sources of Sissoo seedlings or get them from their neighbors or relatives. It is very difficult to get Sissoo seedlings/stumps from government or community nurseries in the Terai, although they are said to be freely available. Even if such seedlings/stumps are freely available, the farmers are very scared of asking for them. When asked, majority of the households are willing to pay 10 to 25 Paisa per Sissoo seedling or stump. The main reason of being suspicious is that one who obtains free Sissoo seedlings/stumps from the government or community nurseries has invariably to sign his/her name or to put thumb mark on a recording book kept by forestry officials. Many farmers see this record keeping system very suspicious, and they think that the the evidence of obtaining free seedlings/stumps from the nurseries might latter be used for nationalizing their private trees.

Private Sissoo trees are lopped once they reach about three years. Majority of farmers lop Sissoo trees once in two years. However, some may lop them once a year. Usually, skilled tree climbers *(Jans)* are employed to lop Sissoo trees. A *Jan* can lop up to 15 trees per day, and gets 8 Kg of paddy plus breakfast *(Jal Khoi)* and lunch *(Kolo)* per day. Sissoo loping is mostly done in Mangsir (October to November) to coincide with the month of parboiling rice, which is also very much practiced in Dhanusa. It takes about 50 Kg of Sissoo (as fuelwood) to boil 100 Kg of paddy.

MARKETING OF SISSOO TREES

Sissoo is multiple use and highly valuable tree for the farmers of the Terai. Majority of the farmers raise Sissoo trees to meet contingencies i.e. to sell them in emergencies. This can also be looked as an impact of imperfect capital market prevailing in the rural of Nepal. Farmers and peasants of Dhanusa borrow money from local money lenders or landlords at an extremely high interest rate i.e. 5 percent per month. So, instead of borrowing money at such a high interest rate, they sell the standing immature trees to the local village contractors to meet their emergency needs. Such needs may arise to pay for medicine / doctor (during sickness), dowry (marriage of a daughter), to buy milking buffalo etc.

Marketing of private trees is well organized in Dhanusa. There are professional contractor who purchase standing Sissoo trees, harvest/log, transport and sell the logs to the local saw mill owners, and the fuelwood to brick kilns or the tobacco curing units. These village level contractors offer prices to the Sissoo tree owners based on ocular estimates of tree volume. A lot of bargaining is made between the owner and the contractor, and a deal is negotiated. A village contractor whom we interviewed said that he would pay Rs. 3,000 to Sissoo tree, whose girth at 5ft. was about 4.5 ft. Once a deal is made, half of the money is immediately paid to the tree owner, and the other half is paid within a week or 10 days. It is estimated that the net profit to a contractor is about Rs. 500 per Sissoo tree.

Once the trees are purchased, a contractor employs local labors to uproot and log the Sissoo trees. The prevailing wage rate is Rs. 35 per day. The cost of harvesting and logging is about 15 percent of the cost of the trees. Once the trees are logged, the timber and the fuelwood is segregated.

The logs are brought to a saw mill, where they are sold at a predetermined price. Similarly, the fuelwood is usually sold to a brick kiln. There are 11 saw mills, and 25 operating brick kiln units in Dhanusa. Most of them are located in and around Janakpur, the district headquarters of Dhanusa. The logs and fuelwood are directly delivered by the contractor himself. The mode of transportation is either a bullock cart or a tractor,

depending upon the size and volume of wood to be transported. The vehicles are locally hired, and the unit cost of transporting logs is about Rs.15/Cft, although it depends upon the distance to be covered. The prime season of tree harvesting is from Kartik (November) to Jestha (May).

The delivered Sissoo logs are measured by length and mid girth in the yard of a saw mill. The volume (cft) of each log is thus calculated based on quarter girth formula. The price of Sissoo depends mainly on the girth of a log. The price of Sissoo log in Janakpur is as follows:

Girth at mid point	Rs. per cubic feet (cft)
Above 4 feet	225-250
3 ft to 4 ft	125-150
2 ft to 3 ft	75-90

The delivered price of Sissoo fuelwood at a brick-kiln unit is Rs. 110 per quintal or Rs. 1.10 per kg.

There are two points that need to be stressed in this marketing chain of Sissoo logs, and their eventual conversion and transportation of sawn timber. They are:

– There is an official ban on the export of unprocessed timber, even though Nepal has a porous border with India. However, market price of bigger size Sissoo log is higher in India than in Nepal.

– Even though private tree owners can do whatever they wish regarding the disposal of their trees, permits are required both to harvest and transport the timber and fuelwood.

With regards to the first point, the price difference of better quality (color and grain) and bigger size (above 4 ft in girth) of Sissoo logs between Dhanusa, and the adjoining Indian side may range from 30 to 70 percent. Part of the reason is due to the fact that there is an official excise duty in sawing timber in Nepal, whereas there is none in India. Thus, there is an unofficial leakage of at least some Sissoo logs from Dhanusa to Bihar, the adjoining state of India. The magnitude of this volume is unknown, since the export of unprocessed timber is officially illegal in Nepal.

Legally, there is no restriction on the harvest and transportation of timber raised on private land within Nepal. However, there are executive orders which forbid both harvest and transport of timber without obtaining proper permits from regional and district forest offices. The issuance of permit is very complex, and ultimately leads to the increased price of timber to the ultimate consumer.

PROCESSING OF SISSOO LOGS

Sissoo logs that pass through the local marketing channels ends up in sawmills. In the fiscal year 1990/91, 63 thousand cft of sawn Sissoo was produced, which represented about 48 percent of the total sawn-wood in Janakpur. During the first eight months of the fiscal year 1991/92, 30,500 cft of sawn Sissoo was produced from the 11 sawmills of Dhanusa. This volume represented about 42 percent of the total sawn-wood produced in Janakpur. If we assume the recovery rate of Sissoo logs to be 40 to 50 percent, then the total volume of Sissoo logs officially sawn in Janakpur appears to be about 100 to 150 thousand cft.

The government obtained a revenue of Rs. 2,347 thousand in terms of excise duty in the fiscal year 1991/92 from the sawmills located in Janakpur. As we discussed previously, about 42 percent of the total Sissoo wood produced in Janakpur in the same fiscal year consisted of Sissoo. Assuming the same recovery rate, and the excise duty of Rs. 25 per cft of sawn Sissoo timber, about 100 to 130 thousand cft of Sissoo logs must have been, as officially reported, sawn in 1991/92 in Janakpur. In sum, it can be said that a minimum of 100 thousand cft of Sissoo logs is annually processed in the saw mills of Janakpur.

SALES OF SAWN TIMBER

A saw mill converts Sissoo logs into four components:

a) Sawn timber (GATTU or PHANTA)
b) Strips (thickness 1" to 2", width 3" to 10")
c) Off-cuts
d) Sawdust

The mill gait price of these items in Janakpur is as follows:

Items	Unit price (Rs)
1. Sawn timber (PHANTA)	250 to 300/ cft
2. Strip	500/100 kg.
3. Off-cuts	160/100 kg.
4. Saw dust	35/sack load

About 60 percent of Sissoo sawn (sawn timber and strip) is purchased, and transported to Kathmandu by private parties. 20 percent is sold within Janakpur, all most all of which is used by furniture making units, and the remaining 20 percent is sold to private parties, who sell them to other areas of Nepal. Most of the off-cuts is

used by the brick kiln units within Dhanusa, and part of this is also sold to other urban areas. All the saw dust is consumed within the urban area of Janakpur for household cooking. There are 69 officially registered furniture making units in Janakpur. Each of these units employs 5 to 10 people as carpenters. About 70 percent of the wooden furniture made in Janakpur is sold in Kathmandu.

CONCLUSION

Farmers and peasants of the terai of Nepal seem to be responding to the increased scarcity of forest products caused by the depletion of forest products in their vicinity. Th conventional wisdom of looking forestry problems of the terai strictly from a Malthusian view point will not lead to an optimum solution. What is needed is to correct policy distortions, and to channelize the ingenuity of the local farmers in the cultivation and management of trees in their farming areas.

There are at least two implications which require new thinking the the promotion of private tree planting in the terai of Nepal. One relates to the supply and demand of good quality Sissoo seedling/stumps, and the other relates to the relaxation of the very complex permit regime with regards to the harvest and transportation of timber and fuelwood in Nepal. The present practice of free seedling distribution is counter productive. Since most of the farmers are willing to pay at least 10 to 25 Paisa per seedling/stump, they should be charged for seedlings/stumps. The permit system as practiced now is also counter productive, since this system has unnecessarily increased the hurdle faced by the farmers, and instability in the price of timber and supply of the fuelwood in Nepal.

SELECTED REFERENCES

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BOOK REVIEW

Nepal, Govind (1992), Economics of Welfare. Mrs. Anju Nepal, Tansen, (Nepal) pp. 81+viii. Price: NRs. 68.50, IRs. 49.95.

Welfare Economics is both a positive science as well as a normative science. It is positive in the sense that it is an inquiry into the causes of social welfare, and normative in the sense that it involves the problem of value judgements and interpersonal comparison of utilities while evaluating alternative economic states. Welfare economics is based on the micro foundations of economic theory with macro applications, and is now being widely used in environmental and resource economics as well.

The book under review is designed to cover the syllabus of welfare economics for M.A. economics course. In this perspective, the book is comprehensive and easy-to-understand to the target audience, because it covers the syllabus of welfare economics for M.A. economics and the minimum use of mathematics has made to understant the content and the concepts even by non-technical readers. The author has done a commendable job by producing this book with that much of coverage and content in a limited period of time. There was always a necessity of a book of this type. This book has filled some of the gap that was felt by many for a long time. This is the major contribution of this book.

There are eight chapters in the book. Starting with various meanings of welfare and defining welfare economics in the first chapter, the author provides a brief historical survey of welfare economics in the second chapter. The third chapter deals with the Pigovian welfare economics. Analysis of externalities, Pigovian optimum and ideal output, evaluation of Pigovian welfare economics and comparison between Pigovian optimum and Paretian optimum are the main topics examined in this chapter. Paretian welfare economics is discussed only in the fourth chapter. Pareto optimality in general, first-order and second-order conditions for Pareto optimality, economic efficiency under different markets, and Paretian welfare economics are evaluated in this chapter. Compensation principle and various tests have been analyzed in the fifth chapter, and the sixth chapter is devoted to the discussion on social welfare function. Arrow's social choice and individual values have been described in the seventh chapter. The eighth chapter, the last chapter, is devoted to the discussion of the theory of second best.

This book undoubtedly is very useful for M.A. economics students as it covers all the topics required for the students. Nevertheless, the book is not perfect and suffers from some deficiencies. The deficiencies can be divided in two parts: coverage

deficiencies and content deficiencies. The major deficiencies of the book can be summarized in the following paragraphs.

The coverage of the book should be extended beyond the syllabus of welfare economics for M.A. economics course by incorporating more topics related to welfare economics. The discussion on externalities is insufficient, and requires more explanation. This book provides no mention of the Coase Theorem, the pathbreaking theorem on externality. The discussion on the divergence between private and social costs is inadequate. The book states that the problem of overproduction will arise when the marginal social cost exceeds the marginal private cost. Therefore, such industries (firms) should be taxed (p. 17). Similarly, there can be situations of underproduction, and subsidy should be given to such industries. But the book is silent about the amount of tax or subsidy, and the procedure to calculate it. The amount of tax or subsidy should be analyzed and exhibited diagrammatically as well as mathematically. A separate chapter could also be established to encompass all these points.

Regarding content deficiencies, too many quotations are found in the book. There are many printing errors, typos and repetition of phrases, quotation (p. 1 and p. 14), and lines (p. 3 and p. 4, p. 57). Citations of literature are found quite frequently, but they do not appear in the references. Regarding the graphs, the horizontal axis and the vertical axis have always been called X and Y in addition to the actual names of the variables that they stand for, which is redundant. Negative signs have been left out while mathematically defining the slopes of indifference curves and transformation curves. Notes and the list of suggested readings are incomplete, inconsistent, and irregular. There is no proper balance among the chapters of the book. Chapters Seven and Eight are too short to be designated as separate chapters. It seems that these two chapters were prepared in a hurry as they look like students' examination notes.

Despite some inadequacies, it is a good book immensely useful for teachers, students and other readers interested in the field of welfare economics. If the above-mentioned shortcomings are taken care of, if more mathematical derivations and interpretations are incorporated in the analysis, and if a professional editor can go over the book with a fine-tooth comb, it will definitely enhance the quality of the book.

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