Findings of Timber Market Survey
For Global Partners for Afghanistan (GPFA)[1]

Submitted September 2007[2]

Objectives (Quoted from GPFA Terms of Reference)[3]

The objective of this study was to provide data on the current timber/lumber market in the project areas and profitable opportunities for the future. The market survey was designed to determine viable products, price, and value added and estimate profitability. A marketing chain approach was used with calculations of mark-ups and added value recorded. Destination of sales or final use of timber was obtained. Surveys were administered to growers, middlemen or lumberjacks, wholesalers and sawmill owners, carpenters, joiners, retailers and processors in Kabul City, Farza, Logar (Puli Alam & Mohd Agha), Gardez City and Wardak (Sayd Abad).

Introduction

This document seeks to provide the groundwork for future GPFA programming and future research on the timber market in Afghanistan. An effort has been made to develop the context where other research efforts can take off. A broad approach to a market survey was employed to capture the breadth of the market since very little research has been undertaken on the timber trade in Afghanistan. Currently there are a few other organizations conducting research in this area (contacts provided below). This report is intended to contribute to a larger effort to understand the volume, flow, and prices of various species of timber in Afghan markets.

Methodology

A stratified sample of timber producers, traders (or middle men between producers and retail), carpenters and fuelwood traders was surveyed from July to August of 2007.[4]

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[1] The survey instrument for this report was submitted to the Committee on Human Subjects review board at Cornell University. This report does not necessarily represent the views of GPFA staff or Cornell University. All names and images have been omitted for confidentiality reasons.

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[3] Terms of Reference (TOR) can be found in the appendices.

Given the time and budgetary limitations, a very small sample was chosen in each of the four major markets in GPFA's coverage area and detailed survey instruments were designed for each of the four groups. More specific research questions were developed to help guide the surveying effort with a goal of creating answerable questions, which could be reasonably well addressed given the limitations of the study.[5] For this reason, the instruments were designed to calculate costs and revenues along the value chain for poplars as well as identification of market inefficiencies. The survey instruments also focused on identifying preferences at all levels which, may have implications for GPFA-supported farmers. The survey included aspects of the timber market beyond poplars to identify poplar substitutes and products that would complement poplars. The main objective in the terms of reference then is addressed based on the answers to these specific initial questions and the overall structure of the market in which GPFA producers will compete. The surveys were executed by two GPFA staff members over the course of a two week period.

Overview of Timber Trade in Afghanistan

There are two distinct local sources of timber harvested in Afghanistan: deforestation of old growth forest in the southern and eastern provinces and timber produced on farm woodlots or along irrigation ditches. The former consists of slow growing hard wood species while the latter usually includes fast-growing softwood species.[6] This study includes a discussion of both categories, although the discussion is focused on the portion of the market relevant to GPFA programming.

The portion of the market consisting of timber products that could be considered either substitutes or complements to the products of GPFA farmers is diagrammed below. The supply side is derived from the two local sources outlined above in addition to a steady supply of timber and timber related products imported from Pakistan, Russia, and China. In cities, fuelwood is largely a by-product of the trade in expensive old growth hardwood species as the majority of this wood appears to be dried roots and branches of pine, willow, oak, cedar, and juniper species. In more rural areas, sources of fuel wood are often limited to locally collected scrub brush on range lands and fast growing species that grow near water sources. The most lucrative timber products in Afghanistan are the blocks of hardwood used for carpentry. A small portion of this is consumed locally but most of this wood seems to be leaving Kabul and other timber markets on trucks to Pakistan and ultimately the United Arab Emirates (Dubai).

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[4]There also exists a group of itinerant lumberjacks, although they were omitted since in most markets either the traders or producers do the wood harvesting.

[5]The main objective in the Terms of Reference (TOR), to identify 'profitable opportunities for the future' is speculative and thus difficult to test through a survey.

[6]The use of the terms hard wood and soft wood are used loosely here as there seem to be no technical definitions of the two categories. Trees considered hard or soft wood in other countries are described differently by Afghans and may simply reflect different growing conditions.

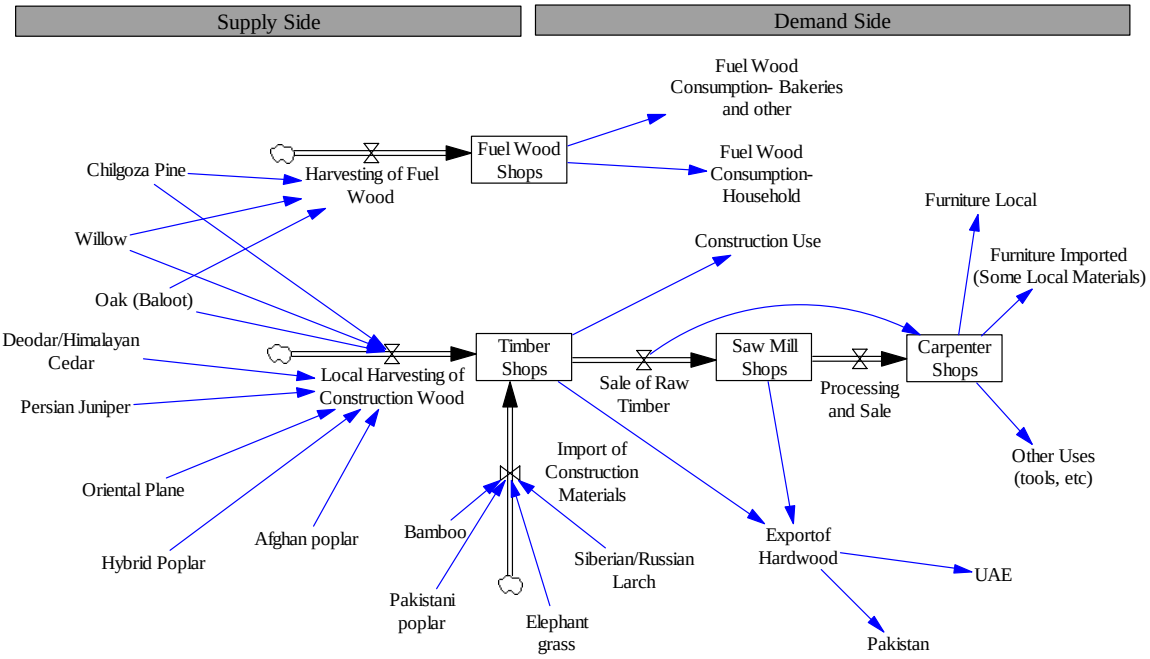

Figure 1. Diagram depicting the flow of timber in Afghanistan

Wood species moving through the timber shops comes from both old and new growth. It is sold in various sizes (more detail below) and has a range of uses. Softer species are used for construction, as posts, scaffolding, and roof beams. Hardwood species are occasionally sold as poles, but are mostly sold in blocks or slabs for milling by middlemen. Often these slabs go directly to the carpenters. It also common to find slabs of softer species including poplar and plane in trader shops for roofing (*chajaki*). A variety of products are imported from Pakistan including bamboo poles, ladders, elephant grass mats and screens, as well as a large portion of poplar.

I. Producers

Given the time it takes to produce and harvest poplar trees, it is not yet possible to empirically measure the returns to poplar production of GPFA beneficiaries. For this reason, enumerators were asked to identify and interview any poplar producers with well-established woodlots with the help of local extension workers. Only 10 poplar producers were located in the four areas with active GPFA poplar programs. This small sample is not uniformly distributed and may not be spatially or economically representative of the

poplar-producing population but a larger survey was not possible due to budget constraints. These 10 farmers currently are producing poplars with limited assistance from extension workers. As a result, these results are indicative of current production techniques and it is possible that GPFA might introduce new management practices that could improve production and profitability beyond the levels reported here. Farm-level surveys of woodlot producers who have harvested from their woodlots were interviewed and average harvests, as well as revenues and costs from production were estimated. This part of the survey will be the basis of a value chain analysis and used to derive a cost-benefit analysis of actual producers.

In general, there are limited data available on input supplies, technologies, product quantity, product quality, and opportunity costs (including production systems of other crops) in Afghanistan. Collecting high quality accurate data from farmers is extremely difficult and time consuming, and requires substantial planning and time which is especially challenging in the given post-conflict climate. However, assessing farm level costs is extremely important due to the intensive water use of poplars and the obvious opportunity costs of land use in Afghanistan (especially in the context of poppy production). Furthermore, resources are very scarce in Afghanistan and poor farmers tend to be risk averse, which could preclude investment in long-term technologies such as tree production. Also, land tenure conflicts often due to returning refugees may contribute to the reluctance to make long-term investments.

Any study of tree crop livelihoods in Afghanistan should consider the opportunity cost of planting poplars and the relative marginal productivity of water. This is an extremely involved question and could be a departure for another study relevant to GPFA. In this report, an effort has been made to qualitatively and quantitatively understand the role of water in poplar tree production although a more detailed plot level study of water consumption is needed.

Producer Data:

This portion of the study was the most challenging, because woodlot production of poplars is not a common practice in Afghanistan. A significant portion of the supply of local poplar traded and produced comes from poplar trees that line irrigation ditches, which are often large in size. Smaller poplars harvested from woodlots and newer forests used for construction as posts and beams come from both Pakistan and Afghanistan.

All of the farmers interviewed were landowners, owning an average of 5.2 jeribs, above average figures in the literature, suggesting that this sample of poplar producers is relatively wealthy.[7] These farmers reported poplar plantation size of an average 1.65 jeribs. They reported paying a minimal tax of about 235 afs/year, equivalent to about 5 USD. All of these farmers were producing the local poplar species known as *arhar* while half were also producing the poplar species locally referred to as *rema*.[8] Two of the ten

[7] According to AREU, WOL data the average cultivated area for the middle-income group of households with limited irrigation was 3.28 jeribs. This is not the best proxy for wealth overall however,

[8] Arhar is referred to as Lombardy Poplar by a Kabul University Professor, Rema is not documented.

farmers were part of a previous project (funded by International Rescue Committee) which, provided inputs to the farmers while the other 8 appear to have cultivated poplars of their own accord. Interestingly, these two farmers who had IRC woodlots previously reported no crop planted in the woodlot location prior to planting the poplar (suggesting they either had no capital to cultivate this land or they were only willing to cultivate on vacant land). Of the other 8 farmers, half reported poplar trees planted prior to the current woodlot while the farmers other half reported wheat (with the exception of 1 who reported maize).

All of these farmers estimated poplar to be their largest income source. Farmers were also asked about crops previously planted in the woodlots. The enumerators indicated that farmers seemed unable to provide accurate information here so it is impossible to calculate the specific opportunity cost for this land.[9] All farmers reported higher water consumption for poplars compared to other species, although quantitative estimates in the survey data were not consistent probably because farmers either did not have the needed data or did not understand the question.[10] The average watering frequency for poplars was every 7.3 days. All farmers had access to a stream and three farmers had access to a river. This is significant considering many farmers in Afghanistan do not have access to any water source and thus do not have access to irrigated land.

Well Costs

Qualitative interviews supported the hypothesis that water access is vital to the success of poplar production. Some producers have their own wells, which can cost more than 12,000 Afghanis ($240) to dig a 5 m deep well on land with a shallow water table near a river. In areas with a deeper water table, the cost would be higher. To extract water from the well, a pump and often a generator is needed. One farmer reported renting a machine for 80 Afghanis per hour once a week (every 11 or 12 days in winter). Other well costs include installation of cement culverts (about 0.5 m high) at 270 af/piece, plus a transportation cost of 40 af transport/10 pieces. Other farmers reported having access to a community water supply that belonged to a local organization, not the local government and receiving irrigation by 'term', which is distributed by a *mirab* (administrator).[11] In one situation, water access was provided one day per week to each village (about 10 families) but they used the *juee* or irrigation ditch, not the river, because obtaining water from the river would require a pump.

Water Term

[9] Current gross margin estimates (for wheat, alfalfa, poppy, etc) vary greatly since inputs and outputs vary. There is no reliable source until AREU releases some of their data.

[10] Answers were expressed as either a percentage or a ratio and farmers did not seem to understand the enumerators' questions. This suggests that a plot level study of water use could be an important area for additional research.

[11] Terms (discussed below) are the common system for distribution of water in Afghanistan. The term is the frequency of the irrigation interval per household. For example a water term of 8 days means that your farm will receive unlimited irrigation on every 8th day. The duration of the interval is not set.

Two farmers reported owning generators and pumps for irrigation, which they ran for 5-6 hours per week. Among those in the sample receiving communal irrigation water, the average water term was (access to irrigation ditches) every 8 days in Loghar and 4-6 days in Gardez and Wardak (it is closer to 8 in many dryer areas in the North and West of Afghanistan) and the mean term length was 4.1 days. Four of the ten farmers answered 'yes' to 'ever paying for water' while seven out of 10 farmers reported paying for access to additional water in dryer years. As mentioned above, qualitative interviews revealed that this is often in the form of accessing neighbor's deep well for a fee. All farmers reported working on communal irrigation, spending an average of 43.8 days on irrigation ditches per annum.

Producer Labor

An average of 12 days per year was spent on weeding and an average of 2.8 days was spent planting. All farmers applied both DAP and urea at a rate of 2.5 applications per year at a cost of 589 afs per application. Controlling for poplar plantation size, the frequency of applications is 1.6 applications per jerib of poplar per year.[12]

Producer Price Data

Prices of poles are reported in length (meters) although each length includes a range of tree diameters (with smaller lengths implying smaller tree circumferences). Producer output prices are negotiated in the marketplace for a given load of wood based on the number of pieces and the average diameter of the poles. There was variation in prices collected from the producers, especially for the smaller sizes (1.5 meter poles) suggesting some market inefficiencies as a result of asymmetric information between producers and traders.[13]

Table 1 depicts a cost benefit analysis for an average producer. The estimates include labor, which is significant for poplar. Cost-benefit analyses for subsistence farmers typically ignore family labor costs although they are included here as an opportunity cost because labor seems to limit production in this sample.[14] Labor, somewhat counter-intuitively, often limits production in many smallholder-farming systems. Removing these costs would decrease total annual costs by about $100 USD per year, increasing profit to $943/year.

[12] Unfortunately only prices and application frequency were collected to estimate costs, not quantities.
[13] A more detailed discussion of prices and quality is undertaken below in the trader section.
[14] Labor costs are also included in trader and carpenter budgets as they are real opportunity costs.

Table 1. Cost Benefit Analysis of Sample Poplar Woodlot Producers[15]				
Average Inputs (Costs) per year for 1jerib of Poplar (from data)				
	Quantity	**Unit**	**Unit cost**	**Total**
Land tax	235	af/year	235	235
Weeding labor	12	days/year	200	2,400
Irrigation labor[16]	10	days/year	200	2,000
Planting labor[17]	2.9	days/year	200	578
DAP/UREA	2.5	apps/jerib/yr	589	1,473
Subtotal (Afghanis)				6,686
Total Cost (USD)	50	afs/USD		**134**
Average Output (Revenue) for 1 jerib Poplar				
	Quantity[18]	**Unit**	**Price**	**Total**
1.5m	385	afs/pole	144	55,505
3m-	381	afs/pole	214	81,448
4m	252	afs/pole	492	123,743
5m	194	afs/pole	617	119,655
Fuelwood (bundle or *band*)	205	afs/kg	50	10,227
Subtotal (afs)		afs		390,578
Total Woodlot (8 year)	50	afs/USD		7,812
Total Revenue per annum (USD)	8	years		**977**
Total Average Profit (annual)[19]				**843**

Timing of harvesting and total woodlot harvesting strategies vary greatly as well and can have a significant impact on the producer's profit (discussed in greater detail below).[20]

[15] These quantities and prices received are averages from the data and reflect the median harvesting strategy since timber harvesting is truncated or "lumpy" with no harvests in most years and big harvests in others. The strategy is then averaged over the total time land was planted with poplars which in this case is 8, since all farmers reported some harvest up to year 8, to come up with an annual figure. This is a somewhat contrived way of calculating average profit but a more representative and less complicated way than calculating each farmer's costs and benefits individually. As mentioned previously if more observations were available it would be better to estimate a profit function using regression analysis.

[16] Irrigation labor was reported in total labor days devoted to communal irrigation. The mean was 43.8 days/annum with very small standard deviation of 2.01. The days of irrigation labor attributed to poplar production are assumed to be about 10 based on the average proportion of land in poplar: total land cultivated.

[17] Planting labor is a fixed cost and would only apply to the first year.

[18] These figures are lower than the averages stated above which were based on 1.65 jeribs and this CBA is based on 1 jerib for purposes of comparison.

[19] If you sum the number of trees sold you see that this is about 1200 trees per jerib. This seems quite high for fully grown trees. GPFA is planting at 1 m x 1m which would be about 2000 trees per jerib, although this is prior to thinning.

[20] The average prices received for Afghan poplar poles were, 144, 214, 492, and 617 afs based on the sizes described in the table above. The average quantity of fuel wood sold by producers was 337.5 kg and all reported a price of 50 af per kg. The average number of 1.5m saplings sold from a 1.65-hectare plot was 636 poles. The average number of 3m pieces sold was 628, the average number of 4m poles sold was 415, and the average number of 5m poles sold was 320 pieces.

The majority of producers in this sample harvested for as long as ten years though the few who were able to harvest earlier achieved greater annual profit. For example, as assumed above, the farmer was able to fully harvest in the 8th year; his profits would be $977/year over the length of the woodlot. However, if the farmer were not able to harvest until the 10th year profits would be substantially lower at $647/year. A more appropriate method of analysis for this type of data would be to estimate a profit function for producers though this would require much more data than is available and was far beyond the scope of the proposed market survey.

Harvesting Strategies

Sales were disaggregated to decipher producer strategies. No producers reported any income from sales prior to the sixth year, which would mean that the 'total average profit' would not be distributed evenly across years since there were no sales until the sixth year. In the sixth year, one farmer sold 1.5 m poles, 3 m poles, 4 m poles, and even reported 5 m poles sales. Three of the 10 farmers reported selling 1.5, 3, 4, and 5 m poles in year seven and one in year 8, representing a complete woodlot harvesting strategy.[21] No sales were reported in the 9th year. In the 10th year, two farmers reported whole woodlot sales of all varieties, one even including some 1.5 m poles.[22] Whole woodlot harvest is thus the dominant strategy, which seems to be less economically efficient than an idealized strategy where profits follow a linear progression (see schematic below).

This shows that there is extremely wide variation in tree growth (a potential area for more study), which may be dependent on the time of planting and management practices. These data reflect the importance of estimating growth rates of local poplar germplasm and the newly introduced varieties used by GPFA which mature earlier. The typical strategy was total harvesting in the 7th or 8th year while the more conservative strategy was harvesting in the 6, 7, and 8th years (orange line below). The stylized optimal strategy (blue line) represents a strategy similar to that envisioned by GPFA where farmers are constantly thinning and selling off saplings or poles, followed by sales of 1.5 m, 3 m, 4 m, and then 5 m trees. In an ideal setting where water and soil fertility do not constrain production, this strategy results in a constant linear increase in marginal productivity over time. However, if the poplars do not receive sufficient water or nutrients, returns may decrease over time (especially beyond the 8th year). Rate of growth data from planting to harvesting could be critical information for poplar producers. For example, if the price of a 5 m pole is double the price of a 4 m pole it would make sense for the farmer to wait to harvest that for twice the amount of time it took the tree to reach 4 meters. However it may be the case that the growth slows once it reaches the 5 m size so the marginal value from 4 meter to 5 meter is actually diminished.

[21] Planting at the beginning of year 1 and harvest cuttings at the end of year 1, for planting in year 2, thus 'year 7', means harvesting after 7 growing summers.

[22] 1.5 m poles had the largest standard deviation at 114. This means that only 65% of the data lie within 114 afs of the mean price.

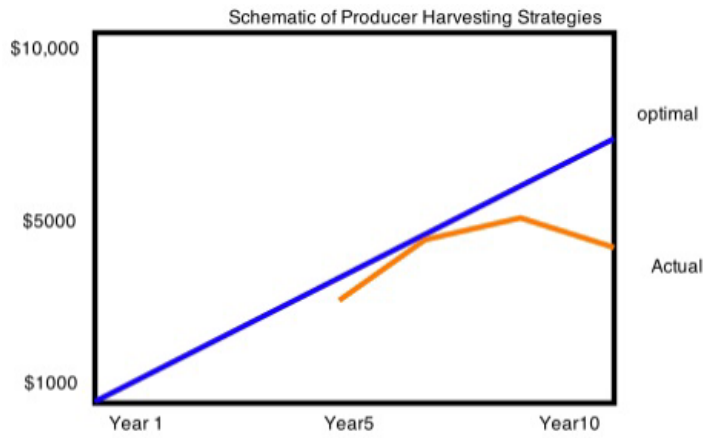

Figure 2. Total Profit over time given stylized 'optimal' and actual harvesting strategies.

Analysis of harvesting strategies and the producer cost-benefit analysis (given its limitations) reveals that the woodlot owners surveyed employ inefficient harvesting strategies.

This production inefficiency may be explained by one or all of the following:

1) Risk associated with long run investment and/or the need for farmers to harvest their crops early or in times of stress.

2) Sub-optimal growing conditions or poor adaptation of specific poplar varieties.

3) Information on pricing of various sizes and species of poles is unavailable to the producers or producers are unaware of the timber market in general.

4) Lack of producer knowledge of profitable marketing strategies.

The above estimates assume that farmers have access to water, which was the case among all producers in the sample. However, the costs of establishing a steady water supply are extremely high and would prevent a large portion of Afghan farmers from participating in this activity. When one considers the opportunity costs and risk (long term investment) associated with poplar production, it seems that it would only be a dominant strategy for producers with good water access (irrigated land). The above cost-benefit estimate reflects sub-optimal production of poplar trees, but it may reveal some important realities. The lack of sales of any products in the first years shows either that farmers are unaware of the market for seedlings or that the demand for seedlings is limited. The current GPFA marketing strategies assume some seedling sales to provide income before trees reach harvest size. A future research topic is to determine the number of farmers interested in poplar production and purchasing cuttings.

II. Timber Traders & Middlemen

Poles leaning on the shops of timber traders are a common sight on the outskirts of Kabul and any of the other cities with active timber markets (see photo above) leading us to believe, that there is a healthy supply of trees in Afghanistan. However, while the local timber traders are making numerous transactions, a substantial portion of this wood comes from Pakistan. There is some debate about the flow of wood among Afghans who claim that Afghan poplar is being bought at low prices by Pakistan producers and resold when prices are high. This theory is beyond the scope of this study but may prove to be an interesting research question for further study. This purported arbitrage would imply that transportation costs to and from Pakistan are minimal, which does not seem to be the case (data show 70,000 afs per truck) and the cost is often shared with the timber dealer or producer who would have little incentive to buy back his own wood at a later date. Similar arguments are made for produce and may reflect political opinions rather than economic realities.

The "value-added" by timber traders may seem nominal but their role is essential to the trade. Occasionally traders were seen stripping bark off the poles although most often traders source the wood in rural areas, and transport it to a more central location for sale, acting purely as collection and wholesale distribution. The business of these traders varied in size, with some shops in Kabul being almost ten times larger than shops in smaller markets.[23] The very small traders are less common and the few interviewed admitted buying from traders in Kabul mostly and reselling in local markets. Some middlemen buy directly from farmers and resell to other timber dealers and sometimes these middlemen are also lumberjacks.[24] The cost of harvesting, the value of the branches, and transportation costs are all important and can increase the cost by as much as 200 afs or 20% of the average price paid to producers. There are also some middlemen between the timber traders and the carpenters although they mostly deal with imported Russian pine or Siberian pine.

Trader Data

A stratified sample of traders was surveyed in four locations: five from Kabul, five from Loghar, five from Gardez and three from the smaller market in Maidan. The small sample size was dictated by time and budget constraints and by our early observation that the markets were small and uniform in size. Two traders from Loghar were tending someone else's shop for a reported 5-6000 afs per month, which one trader reported was "more than he made in a ministry position". Overall timber trader's shops employed an average of 2.5 employees per shop. The shops have been in place for an average of 6 years and the oldest shop was 10 years old. The shop areas averaged 500 m^2 but one shop had an area of 2000 m^2. The average rent was about 3,100 afs per year, although with a high standard deviation of 28,000 afs, demonstrating significant variation between cities.

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[23] Traders were randomly sampled in the four districts and none of the extremely small traders were picked up in the sample, which is a downfall of the small sample size but also demonstrates how few they are.

[24] To be clear this group was omitted for simplicity since this was rarely the case.

Transport

Four traders have wood regularly delivered to them, nine pick it up and, and four rely on a combination of pickup and delivery for their supply. Only one farmer reported owning a truck, while the others all reported renting a vehicle. The average cost of renting a truck varied widely between locations. In Kabul, the average price paid was 5,800 afs per delivery while in Loghar it was about 9,333 afs and in Gardez it was 10,600 afs (this represents average prices as well as prices per destination (eg. specific data on cost per location sourced was beyond the scope of the study). On the other hand, local collection of poplar in the villages nearby Loghar and Maidan cost only 800 afs per trip. The mean truck capacity was reportedly about 550 poles (with standard deviation of about 60 afs).

Transactions

Traders buy from an average of 3.8 sources per week and sell to an average of 13.6 customers per week. The time it takes to complete a transaction or move a given piece of lumber is typically about 2.3 months. All traders reported significantly higher trading in the summer than in the winter.

Trader Price Data

Only one trader in the sample was also a woodlot owner so the majority of traders interviewed only bought and sold timber. Many traders reported prices in Pakistani rupees, which is a common currency in areas south and east of Kabul.[25] Prices were averaged across all traders.[26] The mean profit for a 5 m Afghan pole was nearly double the price received for a 4 m Afghan pole suggesting profits are higher for the larger poles unless there is a slowing of the growth rate after trees attain 4 m. This information could help GPFA farmers to increase poplar profits. Plot level data and estimation of growth rates under various conditions are necessary to calculate the marginal productivity of factor inputs though.

The graph below depicts the average trader profit in the given classification of timber by length. For a given length of timber there is a range of width (diameter) expected. This with is generally a band of only 5 cm, which implies that for a tree of given size there is a particular way it should be harvested. For example if you have a tree which is just over 7 meters in height, the expected yield would be a 3 meter and a 4 meter pole both which would fall within a certain range. A seller could not instead choose to harvest a 5m pole from this tree because the width would not be within the accepted ban. Also a seller would not harvest a 4 m pole from the top of the tree and a 3m pole from a bottom for the same reason. There is significant variation to recommend a much larger sample size of

[25] An exchange rate of 1000 rupees to 820 afs was used.

[26] The mean purchase price of a 3 m pole for all traders in the sample was 246 afs with a total mean sale price of 322 afs for an average profit of 76 afs (refer to bar graph below). Four-meter poles were purchased at a mean price of 473 afs and sold at an average of 607afs for an average profit of 133 afs per 4m pole. The mean price of a 5m pole was 691 afs and the mean sale price was 955 afs for a mean profit of 264 afs.

prices per length to be collected. There are not fixed prices by any means. A more accurate estimation of this would also control for other variables such as quantity purchased, buyer, and month purchased. A more detailed regression estimation of prices based on detailed accounting would be possible if price were monitored over time.

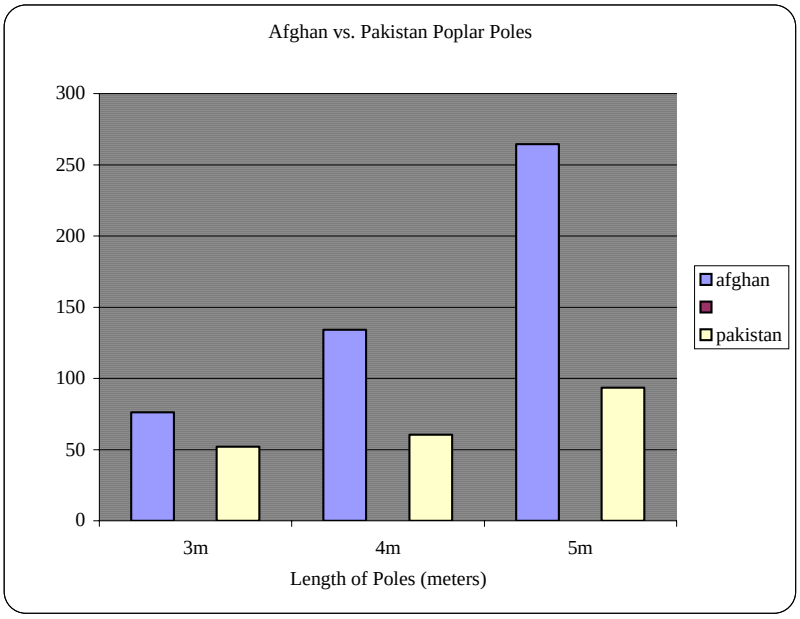

Figure 3. Comparative Prices of Poles[27]

Consistent with qualitative interviews, the profits are considerably lower for Pakistani wood.[28] The profit for selling 5 m Pakistani poles was 93 afs/pole, which is 35% of the price received from selling a similar Afghan poplar pole. Farmers and traders both indicated that Afghan poplar receives less water than Pakistani poplar and thus takes longer to grow (although this may also be attributable to other environmental factors such as temperature, length of growing season, soil, etc). The slower growth is thought to produce tighter rings in the wood, which translates into greater strength for construction and less chance of wood splitting while drying. While these results appear to be promising for the Afghan trader, they may not be as generous for the Afghan producer whose opportunity cost of land will be higher if the trees are slower growing as was reported. These observations apply to the current local poplar varieties, not on the new rapidly growing varieties introduced by GPFA but make it clear that monitoring the marginal value product of water on demonstration plots is necessary to evaluate relative profitability between species.

[27] The variation in size is presumed to be partially captured in the standard deviations of price which for Afghan poles are as follows (82, 83, 138).

[28] The mean purchase price for a 3-m Pakistan poplar pole was 178 afs, 230 afs sale price with a profit of 52 afs per 3 m Pakistani poplar pole. Four-meter poles reportedly were purchased for a mean price of 279 afs and sold for 339 afs for a profit of approximately 61 afs per 4 m pole. Five-meter Pakistani poles were purchased for an average 427 afs and sold for an average of 520 afs per pole.

Volume of Poplar Traded

Transaction data were collected although not all traders were able to provide estimates to the survey enumerators, which may reflect lack of record keeping and the difficulty in estimating monthly transactions. This could also reflect the seasonality of the timber trade and the large fluctuations in transactions from month to month. Some basic assumptions can be made from the available data, however. For Afghan poplar, the average sales volumes (in terms of poles) were approximately twice the trade in Pakistani poles though sold in the same proportion of sizes (see graph below).[29]

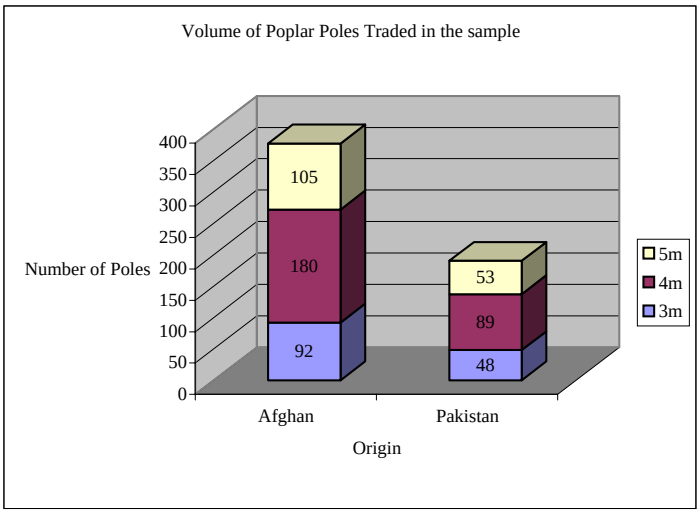

Figure 4. Comparative Volume of Poles on the Market

Other Timber Products in Trader Shops

While the timber market appears to be relatively homogenous with many sellers in close proximity selling similar products, most traders sell a range of goods. While 100% of traders randomly selected in the timber market were selling Afghan poplar poles, only 72% reported dealing in Pakistani poplar poles. One third reported selling Afghan poplar slabs, which are wide boards milled from larger poplar trees often found on the side of irrigation ditches, not in woodlots. These slabs are most often used for roofing and for the walls of small shops in cities. The average 1.5 m 'slab' (of approximately 1.5 to 2 centimeter width) of Afghan poplar is purchased for 70 afs and sold for 95 afs with 25 afs profit. Some of the monthly sales figures were reported by weight, implying that this wood is not always sold per piece even though questions were asked in this way. The

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29 The average number of poles from 3-m Afghan poplar trees sold was 92 per trader per month. Sales of 4 m poles were about 180 poles per month while approximately 105 of the 5 m poles were purchased monthly. Pakistani poplar poles, on the other hand, were reportedly sold in smaller quantities. An average of 48 poles of 3 meter length were sold per trader per month, while 89 poles 4 meters in length and 53 poles 5 meters in length were sold.[1] This means that 47 % of the sales of all poplar poles were 4m poles even though the highest profits are for 5m poles, again demonstrating inefficiency in production strategies.

mean quantity of boards sold per month was 683 kg per trader, though most traders reported selling one *harwar,* which is equal to about 560 kg.

Cedar and Other Wood

Out of the sample, 27% of traders reported cedar transactions although curiously none of these traders was located in Kabul (potentially reflecting the monitoring of this commodity in Kabul). Cedar was sold in the same way as large poplars, either in large rounds or milled slabs. For a 2 m slab, the mean buying price was 90 afs and it was sold for 130 afs at a rate of one *harwar* per month, but only by three of the traders. Rounds of Afghan cedar were all reported as 5 m, with an average purchase price of 520 afs and a sale price of 660 afs leaving a 140 afs profit per trader. This is quite low compared to prices for poplar (about the same as a 4-m Afghan poplar pole), which may reflect the inferiority of cedar as poles for construction.

Russian pine is an extremely cheap product for joiners and carpenters that is occasionally delivered from Russia by truck to traders. Poles of Russian pine (diameter unknown) were reportedly sold by 11% of the timber traders. These traders bought 3 m poles for an average of 1450 afs and sold them for 1600 afs for a profit of only 150 afs for the extremely large pieces. The 4 m poles were purchased for 1650 afs per pole and retailed for 1875 afs, a profit of 225 afs. The 5m poles were purchased for a mean value of 1800 afs per pole and retailed for a mean value of 2050 afs, a profit of 250 afs. One trader also reported selling 3 m juniper poles from Afghanistan at 350 afs a pole for a small profit of 50 afs per pole. Another trader reported dealing in willow, selling 2 m x 50 cm rounds of Afghan willow for 600 afs, netting 200 afs profit per piece.

Non-wood Products

A few other imported products were reportedly sold by approximately 1/4 of the surveyed timber traders. Bamboo poles from Pakistan were purchased for an average 461 afs per 12 m pole and sold for 638 afs for a profit of 178 afs. Bamboo ladders were acquired from Pakistan for an average of 500 afs and sold for 685 afs, a profit of 124 afs. Elephant grass (*Miscantus*) screens were also a common product imported from Pakistan by timber traders though size and pricing method was variable. These grass mats are commonly used for roofing. Elephant grass hay mats were imported for 50 afs apiece and turned around for an average of 75 afs per mat.

Budget Analysis for Traders

A cost-benefit analysis was conducted for traders. The following table is based on a trader who sells only Afghan poplar poles, the most common trader strategy.

Table 2. Trader Monthly Budget Analysis- Annual Profit				
	Size	**Quantity**	**Units**	**Total**
Rent	1 shop	258	afs/month	258
Wages	2.5 employees	5500	afs/month	13750
Pickup	550 poles	9333	trip	9333
				23341
USD Conversion				**466.83**
Input				
Afghan poles				
	3 m	246	92	22632
	4 m	473	180	85140
	5 m	691	105	72555
				180327
				3607
Output				
Afghan poles				
	3 m	322	92	29624
	4 m	607	180	109260
	5 m	955	105	100275
				239159
USD Conversion				**4783**
Total Profit	(per month)			710
Total Annual Profit				**8518**

The data confirm that Afghan poplar is the most lucrative product in the timber shops so it is not surprising that the profit margin is so high in the above cost-benefit analysis. Many shops sell other items as well. The annual estimates may be skewed upward since summer is the construction season when the highest volume of poles was traded.[30] Many of these traders sell poplar poles to expatriate construction firms, which have reportedly distorted prices.[31]

For a trader only selling Afghan poplar the profits are huge. The large estimate may reflect some boasting on behalf of traders as well as the seasonality of demand mentioned above. Profits in winter were reported to be much lower although no quantitative seasonal data exist to corroborate this assertion. Again, it should be pointed out that the CBA also reflects a single bundle of goods, which in this case is a single strategy that was dominant across the sample. Almost all traders sold Afghan poplar although many had also diversified into other species, which is not reflected in these average calculations. Nonetheless, the amount of income from the timber trade for traders is more than 10-fold that of producers.

[31] See Lister and Karaev for more details.

III. Carpenters

Currently, the average Afghan carpenter shops use very little local lumber. Windows and doors are the most common items produced and are almost always made of wood reportedly coming from Russia. The construction is basic, but carpenters have the tools to quickly turn out generic and custom sized windows though most were generic (2 m x 1 m). The preferences of carpenters reflect the perceived market demand. Many carpenters reported that they preferred higher quality species of wood such as oak, but that they simply cannot sell it because the cost of the wood is so high.

Carpenter Data

Using a questionnaire similar to that given to the traders, carpenters from four locations were surveyed. Only one of these carpenters was not the owner of his shop and those paying rent paid a mean value of 566 afs per year (about 10 dollars). There was an average of 2.16 employees per shop with an average age of businesses at 6.9 years. Surprisingly, two-thirds of the carpenters had received training abroad (most likely in Pakistan although this was not recorded). In Gardez, reportedly the largest timber market in Afghanistan, all carpenters reported 'pick-up' of materials, while only 41% overall reported picking up their own materials. Two thirds of carpenters who have wood materials delivered pay for the transportation of those materials themselves. They reported a mean value of 11,090 afs per delivery. Only one carpenter (5%) owned a truck. Half of all of the carpenters surveyed pay taxes for transport. The average tax on transportation is 475 afs per truck, nearly 5% of the total cost of a trip (this figure is not weighted based on distance and the standard deviation is 212 afs, about half the total tax).

Carpenter Transactions

Carpenters reported an average 4.22 sourcing contacts (for wood), and 8.5 transactions with customers per week. The average time it takes to find a buyer was reported to be 1.5 months (although most carpenters reported that customers most often came to them with a specific project). All firms reported registering with the government, obtaining a trade license, and paying taxes. The amount of taxes varied greatly around the mean value of 3,191 afs per annum with a standard deviation of 4,525 afs per year.[32]

Reported price increases from last year varied. One half of the carpenters estimated the change in prices of materials from last year as a 20% increase, one third estimated it to be about 30% while one carpenter noted no change and another reported approximately a one percent change in prices. The enumerators seemed to think that carpenters who bought wood from Mazar reported the 20% increase while those from Kabul reported the 30% increase although prices should theoretically respond to the arbitrage given the uniformity of product. It was however, unanimous however, that input prices were increasing.

[32] Since a few carpenters in Kabul are paying 12,000 afs or more

Equipment

Sixty-one percent of carpenters own a band saw, and seventy-eight percent own a table saw. The average estimated value of this capital (not depreciated) was 52,643 afs for a bandsaw and 46,646 afs for a table saw. These costs are a significant barrier to entry into the carpentry business, but are quite minimal in the context of the carpenter's budget over the lifetime of the machinery (see carpenter cost benefit analysis below).

Carpenter Preferences

Only one carpenter reported no preference in wood species. Thirty-eight of carpenters stated a preference for wood coming from Russia since it was the cheapest product available. The exact species of this wood is not clear. Afghans refer to this as 'Russian Pine', although it is most likely *Larix sibirica*, commonly known as Russian or Siberian Larch.[33] Twenty-two percent of farmers stated that juniper was the best wood for carpentry due to the superior strength of the wood. Seventeen percent preferred cedar for the strength and seventeen percent preferred *deodarus* simply "because they liked it". All carpenters reported that they found local wood to be high priced, and felt that there were too many skilled carpenters on the market.

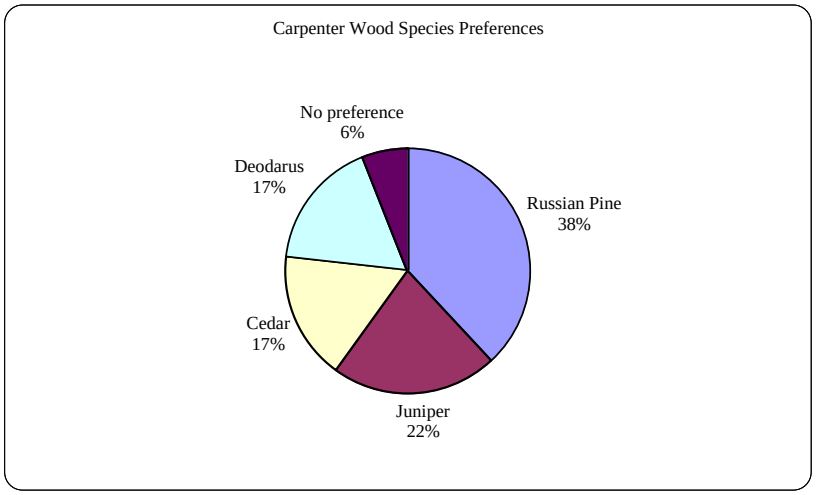

Figure 5. Carpenter Preferences Pie Chart

[33] The Siberian Larch is common to western Russian and is especially valuable for posts and poles due to its rot resistance. It has also been suggested this wood may be *Pinus Wallichiana*, commonly known as Blue or Bhutan Pine, although this is native to Afghanistan and the wood is moderately hard, durable and highly resinous. In this report I will continue to refer to this as pine coming from Russia or Russian pine since larch is also in the Pinaceae or pine family.

Carpenter Prices[34]

Input Prices:

All carpenters purchased Russian pine for an average of $300 per m3. This pine is typically purchased by the cubic meter although it sometimes was reported as 18 or 20 cm x 18 cm. The average quantity of pine purchased per month per trader was 4.67 m^3. Most carpenters did not report transport costs although two carpenters reported a nominal cost of 50 afs per m^3, suggesting that Russian pine is mostly delivered to carpenters or purchased from shopkeepers who store and mill Russian pine into pieces consumable by carpenters (see photo below). Deodar cedar was reported in board feet and cubic meters; an average of 15,500 afs per m^3 and 1024 afs per board foot. Two carpenters surveyed had purchased poplar boards 3 meters in length by 60 cm to be used for construction though they were not currently producing any poplar products. In qualitative interviews, many farmers indicated that poplar warped more than pine although this may be attributable to lack of information about proper drying and seasoning.

In the carpenters' market, there seems to be a range of prices and sources for some wood although almost all are selling Russian Pine for the same price. The variability is in the cost of higher quality woods.

Output Prices:

The average price paid for a pine and particle wood door (roughly 1m x 2m) was 1,961 afs (below is an example of an all-pine door although almost always the center is made of inexpensive particle board imported from Pakistan). Two carpenters reported producing similar sized doors of juniper, which retailed for slightly higher at 2,500 afs. On average, carpenters produced sixteen doors per month. Pine windows frames were also produced by all carpenters for an average price of 2,455 afs per window. However, window frame sizes ranged from 150 cm to 2 m and prices did not always correlate with size. Carpenters reported producing an average of 18 pine windows per month. Two carpenters produced juniper windows for 2,500 and 3,000 afs apiece (approximately 10 per month) and 44% of carpenters sold sawdust for a mean value of 3,062 afs per *harwar* (560 kg).

A generic carpenter budget is estimated below based on average prices and quantities reported. The estimate assumes that the carpenter is purchasing his own wood although a few farmers mentioned they occasionally accept wood from farmers and simply build the items for them (in this case species like poplar might enter the carpenters' market). In Gardez, a particularly skilled carpenter was training young boys in his shop and produced many products from expensive hardwoods. He owned additional machinery including a lathe, joiner, and a drill press used to construct tables and other furniture for wealthy families.[35]

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[34] Refer to the table below.

[35] This carpenter is not in the survey and no similar carpenter was encountered after this.

Monthly Carpenter Budget Analysis				
Fixed costs	Size	Cost	Quantity	Total
table saw*	small-pakistan	46646	120	389
band saw	small-pakistan	52643	120	439
rent	monthly	47	1	47
USD Conversion				875
				17
Input costs				
species	Size	Cost	Quantity	Total
russian pine	m3	300	4.67	1401
particle wood	4'x8'	8	4	32
wages**	2.16	4	24	207
				1640
Output (revenues)				
pine door	1mx2m	2500	16	40000
pine window	2mx2m	2455	18	44190
saw dust*	560 kg	3062	1	3062
USD conversion				87252
TOTAL				**1745**
Total Monthly Profit				87
Total Annual Profit (USD)				**$1046**

Fixed costs for carpenters are much lower than for timber traders. Many shops are simply small tents or wooden sheds which house the machinery. Very little storage area is needed since most joinery work is on commission. Input costs are high but there is little risk since most carpenters have buyers before they begin construction.

IV. Fuelwood traders[36]

The trade in old growth hardwood species is being studied in more detail at the Wildlife Conservation Society (WCS) with an emphasis on deforestation.[37] Another study is being done by Afghan Conservation Corps on household consumption of fuelwood in

[36] This section neglects village and community consumption of fuel wood which may be different than urban consumption. This will need to be explored in future research if it is not covered in WCS and ACC studies.

[37] Contact Alex Dugan for more information on WCS and Linda Norgrove at ACC.

Kabul. The intent in interviewing a sample of fuelwood producers as part of this study was to get a more in depth look at the substitutes and complements of local timber products that may have implications for GPFA producers.

Fuelwood Data

Similar to the other surveys, a small sample of fuelwood traders was interviewed (n=18). Only one did not own his shop and reported a monthly salary of 5,000 afs, about the same as the salary for an employee at a timber shop. There were an average of two employees per shop. Shop owners reported selling fuelwood for an average of 6.9 years. The mean rent paid per annum was 32,411 afs, significantly higher than the rent paid by carpenters and traders (about 500 afs for carpenters and 3,000 afs for traders), which may reflect some informal fees levied due to the illegality of some of the wood. Seventeen percent of the fuelwood dealers picked up all of their wood supply, 27% of the fuel wood dealers picked up some and had some of their supply delivered and the remaining 72% relied on having their wood delivered to them. Only 11% owned a truck and the average cost per delivery of fuelwood was 8,688 afs for a truck with an average capacity of about 8,000 kg. As opposed to the wood traders, the fuelwood dealers simply retail the wood and are not involved purchasing it from producers and transporting it to market..

Transactions

Fuel wood dealers interacted with an average of five sources of fuel wood per month. They sold to an average of 13.8 customers per week and the average time it took to sell a load of fuelwood was 1.6 months. Most fuelwood transactions took place predictably during the winter and the fewest were in the summer. This is the opposite of the trade in timber since the Afghan winter is not conducive to construction and wood is often burned to heat homes.

All dealers were registered and the average tax was about 659 afs, a figure that was slightly skewed upward by one fuelwood dealer in Kabul who was paying about 2,000 afs per month in taxes. Only one out of the sample of 18 traders reported paying unofficial bribes, although in qualitative interviews, some fuelwood and timber traders reported paying bribes suggesting that they may be unwilling to reveal this information.

No one in Wardak reported having access to credit and overall 33% reported no access to any source of credit. Thirty-eight percent of fuelwood traders offer credit to their customers and none of them reported charging interest.

Fuelwood Prices[38]

The price data for fuelwood species were much more homogeneous than prices for the other wood products, demonstrating more efficient market performance. *Baloot* or red oak was the most expensive wood with an average price of 5.95 afs per kg. However,

[38] See appendix with local (dari) names of all species found along with scientific names.

oak with bark sold for 5.17 afs per kg, the branches sold for 5.53 afs per kg, and the roots without bark sold for 6.51 afs per kg. Fuelwood producers at all four markets surveyed unanimously reported that oak was consumed by bakery owners and originated in Mangal. Timber traders reported selling an average of 3,002 kg of oak per month and paying an average of 57,846 afs per truck of oak pieces. Oak is preferred for its density and due to consumer preference, while juniper is favored for its lower price. All fuelwood traders reported higher prices of fuelwood, steep rent, and the low availability of local wood as problems for their business. [39]

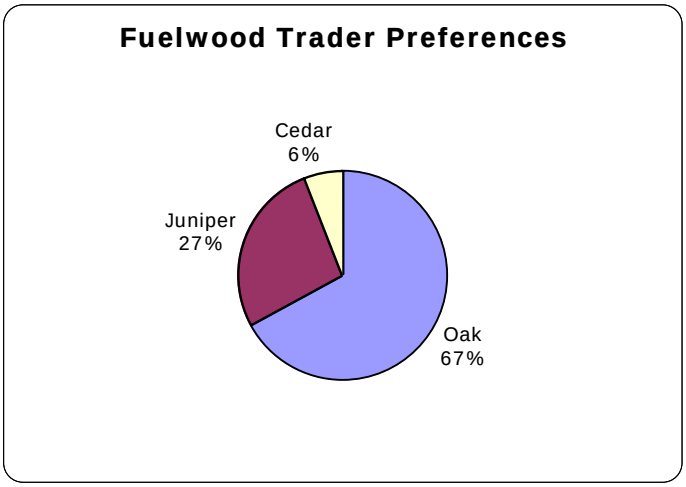

Figure 6. Percent of Carpenters Preferring Wood Species

All fuelwood dealers reported paying 5 afs per kg of cedar. Cedar was predominantly purchased by locals and was reported to have originated in Jaji. Fuelwood dealers reportedly sold an average of 2,692 kg of cedar per month and the average cost per truck was estimated to be about 48,182 afs (though these estimates are not exact since we do not know the exact capacity of each truck).

species	Dari name	afs/kg	V/mo	afs/truck[40]
Juniper	*Archa*	4.95	2,814	49,923
Cedar	*Lamanz*	5.00	2,692	48,182
Oak	*Baloot*	5.95	3,002	57,846
Pine chalghoza	*Jalghoza*	4.94	2,256	49,444

Table 4. Summary of average Fuelwood Price and Volume Data

Juniper (*archa*) and Chalghoza Pine (*Jalghoza*) received the lowest price at 4.95 and 4.94 afs per kg respectively. Locals more commonly use juniper and NGOs and government more commonly use Chalghoza. Juniper originates from Paktika and chalghoza comes from Khost. The mean quantity of wood sold per trader per month was 2,814 kg of

[39] Training was conducted for the survey team to reduce discrepancy in species identification.

[40] The inconsistency in price ratio between the afs/kg and afs/truck reflect the variation in distance and destination.

juniper per month and 2,256 kg of chalghoza per month. A truck of juniper from Paktika was estimated to be 49,923 afs while a truck of chalghoza from Khost was estimated to cost about 49,444 afs.

All fuelwood traders reported selling both Juniper and oak, while 61% reported dealing in chalghoza pine and 67% in cedar. Due to the regional specificity and small sample size, it is unrealistic to make assumptions about national trends although we can draw some inferences from the data.

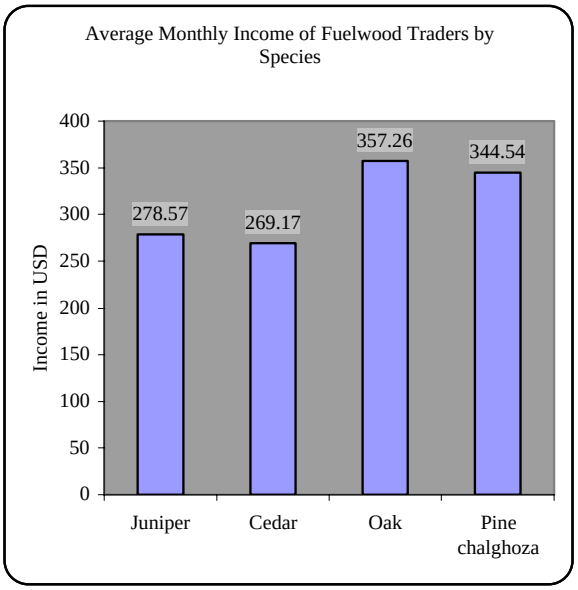

Figure 7. Trader Income by Species of Wood

Fuelwood Trader Cost-Benefit Analysis

Below is a cost-benefit analysis of an average fuelwood trader employing an average marketing strategy. This trader is dealing in three species of wood and is able to ship the average quantity reported per month.

Table 5. Fuelwood Trader Annual Profit

Costs			**afs/month**	**$/month**
Rent	32,411	afs/year	2701	$54.02
Taxes	659	afs/year	55	$1.10
Salary[41]	200	afs/day	4800	$96.00
Delivery[42]	8,688	afs/delivery	8,688	$173.76
			16244	**$324.88**

[41] An average of two employees was reported and all shopkeepers owner their own shops so the difference is one salary (consistent with other estimates in this report).

[42] It is assumed that an average of one delivery is made per month. The average kg delivered was about 8,000 kg which was the reported mean truck capacity per delivery.

Revenues				
Species	**Price**	**Quantity**	**Total (afs/mo)**	**Total ($/mo)**
Juniper	4.95	2,814	13929	$278.59
Cedar	5	2,692	13460	$269.20
Oak	5.95	3,002	17862	$357.24
			42251	**$905.02**
Total Profit	(month)		29,007	$580.15
Total Profit	(year)		348,088	**$6,961.77**

Conclusions[43]

The data show that the producers capture the least amount of profit, which is typical of many value chains. However, in this case, the average value chain for poplars involves only the producer and the traders (and occasionally the lumberjack) who market directly to consumers. It does not seem appropriate to present these data using a typical value chain analysis with a pie chart depicting the percentage of profits in each sector, since there is not a true value chain for poplar since in many cases what the producers sell is the final product.

The more important question not answered through this market study concerns the relative profitability of poplar trees. It is important to know whether the farmers are better off growing poplar compared to fruits, wheat or poppies. There does not exist solid data in the literature on the gross margins of alternative crops. The cost-benefit estimates in this paper are rough but promising. However, if GPFA is going to continue to encourage poplar production, they need to know that farmers can profit and are profiting by recording sales figures from their beneficiaries since there are not many farmers producing poplars or other trees in a woodlot setting.

Examination of the average prices reportedly received by producers for 3, 4 and 5 m Afghan poles (214, 492, 617) afs compared to prices charged by traders (246, 473, 691) afs, a discrepancy of +32, -19, +74 afs, respectively, is evident. Unsurprisingly, the price of 4-meter poles seems to be the most competitive. This suggests that the 4-m poles 4 could be loss leaders for some traders, or their reporting and record keeping is poor. Given the high standard deviations of trader prices cited above these figures most likely reflect the variability in prices between traders. This also implies that 4-m poles may have less elastic prices in general due to higher demand (and perhaps higher supply). Traders have a high rate of transactions and make a lot of their profit through the volume of their trade.

This still does not answer the question of where the high volume of trade comes from. A few sources (non-government, not traders) believed that the distinction between Afghan

[43] The conclusions refer directly to the questions stated in the terms of reference, however, as I have indicated there are more important questions that should/could be addressed in the future.

and Pakistani wood was not legitimate and that consumers and traders could not tell the difference. There were allusions to high levels of arbitrage taking place between the border between Afghanistan and Pakistan (Pakistan traders buying Afghan timber when the price was low and reselling it when it was high).[44] The data suggest that this was not the case although all of the price information came from traders who were specifically asked about the origin of wood and who have an incentive to maintain the current price schemes.

The data in the graph below represent the profits of each player in the timber market. In these estimates, assumptions used in the cost benefit analyses above apply.

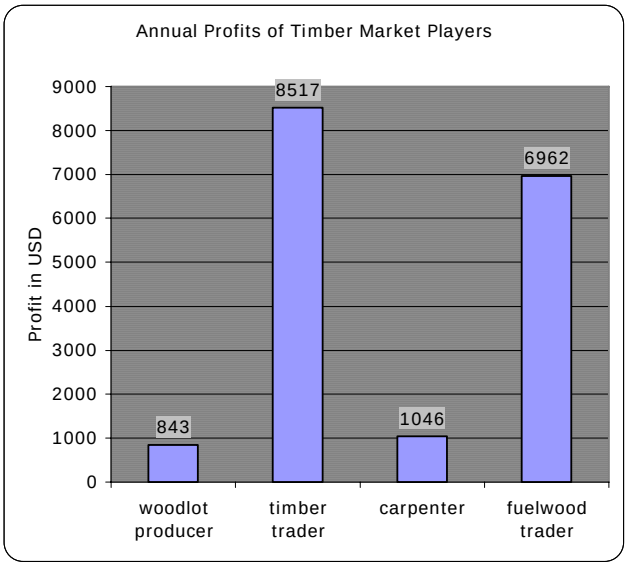

Figure 8. Comparative Estimates of Profits from Timber in Afghanistan

It is clear that traders gain the largest portion of profits from poplars. Carpenters and joiners rarely use poplar and make little profit from their trade. Producers in this sample appear to do relatively quite well from producing poplars (compared to gross margins from wheat and other crops). As was mentioned previously in most of Afghanistan water is the most limiting production input although no farmer in this sample suggested any problems with water. This means that any comparison of relative profitability must only be done with farmers producing alternative crops that also have unlimited water access (stream or river). The risk of crop loss is low for poplar although the risk associated with opportunity costs of land and water and the future of the poplar market are high. As mentioned previously, small changes in harvesting strategies could greatly improve producers' profit margin. Furthermore, it is evident from the data that the trade in timber products entirely overshadows the profits from production of these goods.

[44] This has also been said of other products in Afghanistan and may simply reflect the animosity between the two countries rather than the reality of the arbitrage.

The diagram depicting the flow of timber (Figure1) at the beginning of this document illustrates both uses and in some cases destinations of specific timber species. The current market for poplar is quite limited in scope but does not appear to be limited in scale. Adding greater value to poplar does not appear to be a viable option considering market preferences (but profit may be improved through information dissemination and price reporting). There is a small amount of local poplar furniture on the market in Kabul of low quality, which is reportedly most often bought by expatriates. Most of the furniture available in Kabul is from abroad, mostly China and Taiwan, and is constructed of particle wood and other inexpensive composite products produced cheaply and imported. Currently, there is no local particleboard processing facilities due to the low costs of Pakistani and Chinese particleboard. Nuristani furniture is of much higher quality and uses harder woods such as walnut, to produce intricately carved boxes. Imitation furniture made of cheap pine to look like traditional Nuristani products is also produced but appears to be also part of the tourist market only.

It is impossible to predict market performance in this economic and political climate. There exists no formal research, no price data, only anecdotes, which are often conflicting (e.g. the example of arbitrage between Afghanistan and Pakistan). The presence of I-beams or girders at timber shops leaving Kabul towards Maidan portends a changing market for timber poles as a construction input although it is impossible to determine the magnitude of this trend without a closer study of the market for steel.

The preferences reported and volumes traded may have implications for GPFA-supported farmers. Faster growing species are not suited for carpentry, joinery, firewood, or furniture making.[45] They are not as dense so they warp easily and do not burn at high temperatures like hardwoods. We saw that the producers prefer hybrid species, while the traders prefer high quality Afghan poplar and the carpenters prefer hardwoods. A large portion (perhaps as high as 90%) of the people in Afghanistan cooks with wood. It does not seem possible to meet this demand from the waste from the old forest timber trade in the long run although poplar is a poor substitute. As fast growing softwood, poplar has few options in Afghanistan beyond the current market usages.[46]

[45] Test of suitability of wood species for various purposes have been conducted. A student at Purdue reportedly did this although this information appears not to be available. This is also an observation from carpenter interviews.

[46] Poplar is also used in box-making and other packaging, matches, pallets, fruit bins in other countries though currently this seems to be a very small portion (box making and hives) or non-existent. During qualitative interviews it was noted that there a few carpenters produced boxes although none in the survey reported this activity.

Recommendations

- Optimize woodlot harvest strategies to maximize profits per jerib
- Do not encourage production of poplar for fuel wood or carpentry markets (poplar producers are better off selling their poles than trying to reposition themselves in the fuelwood or carpentry markets).
- Conduct further examination of the transportation structure of marketing poplars to determine if interventions by GPFA are productive
- Conduct (or continue) in depth research and monitoring of tree growth at the plot level
- Extend efforts into basic business, marketing, and economics for producers incorporating harvesting strategy, marginal productivity, and cost-benefit concepts
- Monitor farm gate prices to reduce information asymmetry (and potentially improve competition among traders for wood sourcing)
- Cultivating a connection with the Ministry of Agriculture , Irrigation and Livestock(MAIL) who compiles regular price data on agriculture commodities could be helpful.[47]
- To realistically understand market trends detailed time series data at the farm/ household level would be useful.
- Further research based on specific research questions based on a larger sample of time series data will be a better way to guide GPFA programming as well as to answer the more abstract questions outlined in the terms of reference such as; what does the future of poplar production look like?

[47] Contact Gulam Rabbani at FAHHM/MAAH for further information on price monitoring.

Appendix 1. Terms of Reference for Timber Market Surveys as part of GPFA/Cornell Forestry program.

Introduction and Background

Objectives

1. To provide data on the current timber/lumber market in the project areas and profitable opportunities for the future.

Scope of Work

The market survey should determine viable products (furniture, poles, timber, saplings, baskets), price, and value added, including products and profit. Community and agricultural uses of trees such as fodder, fuel, nitrogen fixation, windbreaks etc should be included.

Desk Research

Information should be sought from the following sources to confirm suitable species:

- Government (MAIL Forestry Dept),
- NGO (AKF, Madera, DACAAR, IFHope, WCS, ICIMOD),
- and university and other academic sources (local – Kabul & Gardez, regional - Pakistan, India, Tajikistan, Iran, China, international - ICIMOD, ICRAF, USA, Canada, FAO)

Market Data

- The following tree species should be included:
  Poplar, Willow, Black locust (*Robinia pseudoaccacia*), Cedar, Oak.
  Other species should be included where locally significant.
- Data should be collected for 2004, 2005 & 2006. Price and volume (if available) data should be collected and a list of data sources provided.
- The marketing chain should be followed with details of mark-up and added value recorded. Destination of sales or final use of timber should be obtained. E.g. construction, carpentry, joinery, biomass, fodder, fuel.
- Information should be collected from:
  - growers,
  - middlemen or lumberjacks,
  - wholesalers and sawmills,
  - carpenters, joiners, retailers and
  - processors (e.g. chipboard manufacturers).
- Surveys should be conducted in Kabul City, Farza, Logar (Puli Alam & Mohd Agha), Gardez City and Wardak (Sayd Abad).

Tasks and Responsibilities

GPFA will provide to the Marketing Consultant lists of selected growers and foresters, plus market and other local knowledge (e.g. contact in Gardez University).

GPFA will provide simple office space in target areas together with transport (local car or motorcycle) and interpreters. Accommodation is available in Kabul office.
The Marketing Consultant will design questionnaires, discuss and get approval from GPFA before starting surveys.
The Marketing Consultant will provide a summary of results in a written report to GPFA.

Management and Planning

Security is an issue in some project areas and this will need to be discussed with the Programme Manager and local Extension Supervisors.

Deliverables

Written reports should be provided by end August 2007 (timing negotiable).

Timetable

Months	Weeks	Activity	Duration
June	1	Confirm ToR	
	2-3	Design Survey and agree with GPFA	1 week
Jun/Jul/Aug	3-11	Conduct Surveys	9 weeks
August	12	Write Reports	1 week
	13	Deliver and present reports	1 day

Appendix 2. Some Common Species of Trees found in Afghanistan

Latin Name	Common Name	Pashto / Dari
Cedrus deodara	Deodar Cedar, Himalayan Cedar	Ilmanz
Juniperus semiglobosa	No Common Name	
Juniperus excelsa, sub sp polycarpos	Persian Juniper	Obakht
Pinus wallichiana	Blue Pine or Bhutan Pine	Nishtar
Pinus gerardiana	Chilgoza Pine (source of pine nuts)	Gerghoza
Picea smithiana	Morinda Spruce or West Himalayan Spruce	Srap
Picea abies	Norway Spruce or Christmas tree	
Picea orientalis	Caucasian Spruce or Oriental Spruce	
Abies spectabilis (webbiana?)	Himalayan Fir	Bijur
Abies pindrow (webbiana?)	Pindrow Fir or West Himalayan Fir	Bijur
Quercus baloot	No Common Name (Oak family)	Serai
Quercus dilatata	Moru Oak	Serai
Quercus semecarpifolia	Brown Oak or Kharshu Oak	
Platanus orientalis	Oriental Plane	Chenar
Salix Spp.	Willow	Beda
Populus Spp.	Poplar	Chenar
Mescanthus	Elephant Grass	
Dendroclamus Stinctus	Bamboo	
Larix Sibirica	Siberian/Russian Larch	Khar-i-rusi

References

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