

Section III: Forest Products and Services: Valuation Ranking & Marketing and Utilization Trend

Forest Products and Services: Valuation Ranking

- 5.1 For the 10 different forest types, the following tables list products and services into components / assets (wood and non-wood), functions and services (e.g., soil fertility maintenance, microclimate stabilization), and diversity and attributes (e.g., biodiversity). The different parameters are brought into line with the Pakistan context by assigning low / medium / high rankings (see key at the bottom of each table). In particular, the rankings refer to importance to the assessment.
- 5.2 Tables 1-10 are important guidance in and of themselves. They are to be consulted while proceeding with identifying the scope of DUV, IUV, and NUV studies to be undertaken and grouping the preliminary information requirements. If these information needs are correctly appraised, the task of determining resource constraints to obtaining primary and secondary information, the data collection methods required, and the appropriate choice of valuation technique will all be facilitated.
- 5.3 The format for the tables is adapted from Barbier E.B., Acreman M., and D. Knowler. 1997. "Economic Valuation of Wetlands: A Guide for Policy Makers and Planners". Ramsar Convention Bureau. WWF-P staff economists and key informants were consulted to assign rankings for each forest type. Guidelines relating to use of the tables is contained in section IV, sub-section 7.32.

Mangrove Forests (Type 1)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	♦♦		
2. Non-wood Resources (resin, medicines, roots, prawn feed, fodder)	♦♦		
3. Wildlife Refuge	♦		
4. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Flood/Storm Protection		♦♦♦	
2. Fish/Shrimp/Marine Nurseries (Fisheries Protection)		♦♦♦	
3. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦♦	
4. Microclimate Stabilization		♦♦	
5. Shoreline Stabilization		♦♦	
6. Carbon Sequestration		♦♦	
7. Watershed Protection		♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Tropical Dry Deciduous Forests (Type 2)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	♦♦		
2. Non-wood Resources (edibles, medicines, fodder)	♦♦		
3. Recreation / Tourism	♦		
4. Human Habitat	♦		
5. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Flood Regulation		♦♦♦	
2. Watershed Protection		♦♦	
3. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦♦	
4. Microclimate Stabilization		♦♦	
5. Carbon Sequestration		♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦
2. Cultural / Spiritual / Aesthetic			♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Tropical Thorn Forests (Type 3)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	♦♦		
2. Non-wood Resources (edibles, fruit, honey, medicines)	♦♦		
3. Recreation / Tourism	♦		
4. Human Habitat	♦		
5. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Microclimate Stabilization		♦♦	
2. Watershed Protection		♦♦	
3. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦	
4. Flood Regulation		♦	
5. Carbon Sequestration		♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦
2. Cultural / Spiritual / Aesthetic			♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Sub-tropical Broad Leaved Evergreen Forests (Type 4)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	♦♦		
2. Non-wood Resources (edibles, fodder, gum/extracts, medicines)	♦♦		
3. Recreation / Tourism	♦		
4. Human Habitat	♦		
5. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Watershed Protection		♦♦♦	
2. Slope Stabilization		♦♦♦	
3. Microclimate Stabilization		♦♦	
4. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦♦	
5. Carbon Sequestration		♦♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦
2. Cultural / Spiritual / Aesthetic			♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Sub-Tropical Chir-Pine Forests (Type 5)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	♦♦		
2. Non-wood Resources (edibles, fodder, resin, medicines)	♦♦		
3. Recreation / Tourism	♦♦		
4. Human Habitat	♦		
5. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Watershed Protection		♦♦♦	
2. Slope Stabilization		♦♦♦	
3. Microclimate Stabilization		♦♦	
4. Carbon Sequestration		♦♦	
5. Flood Regulation		♦♦	
6. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦
2. Cultural / Spiritual / Aesthetic			♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Himalayan Moist Temperate Forests (Type 6)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Recreation / Tourism	♦♦♦		
2. Wood Resources (timber, fuelwood)	♦♦		
3. Non-wood Resources (edibles, oil, resin, medicine, nuts, mushrooms)	♦♦		
4. Human Habitat	♦		
5. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Watershed Protection		♦♦♦	
2. Slope Stabilization		♦♦♦	
3. Carbon Sequestration		♦♦♦	
4. Flood Regulation		♦♦♦	
5. Microclimate Stabilization		♦♦	
6. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦
2. Cultural / Spiritual / Aesthetic			♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Himalayan Dry Temperate Forests (Type 7)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Recreation / Tourism	◆◆◆		
2. Wood Resources (timber, fuelwood)	◆◆		
3. Non-wood Resources (edibles, Chilgoza, nuts, medicine, mushrooms, resin, oil)	◆		
4. Human Habitat	◆		
5. Educational and Scientific Uses	◆		
Functions / Services	Direct	Indirect	Non-Use
1. Watershed protection		◆◆◆	
2. Slope Stabilization		◆◆◆	
3. Flood Regulation		◆◆	
4. Carbon sequestration		◆◆	
5. Microclimate stabilization		◆◆	
6. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		◆◆	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			◆◆
2. Cultural / Spiritual / Aesthetic			◆

Key: ◆ = low ◆◆ = medium ◆◆◆ = high

Sub-Alpine Forests (Type 8)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	◆◆		
2. Non-wood Resources (edibles, medicine, fodder, extracts - e.g., from birch)	◆◆		
3. Recreation / Tourism	◆◆		
4. Human Habitat	◆		
5. Educational and Scientific Uses	◆		
Functions / Services	Direct	Indirect	Non-Use
1. Watershed Protection		◆◆◆	
2. Microclimate Stabilization		◆◆	
3. Carbon Sequestration		◆◆	
4. Slope Stabilization		◆◆	
5. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		◆	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			◆◆
2. Cultural / Spiritual / Aesthetic			◆

Key: ◆ = low ◆◆ = medium ◆◆◆ = high

Alpine Scrub (Type 9)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	♦♦		
2. Non-wood Resources (edibles, fodder, medicines)	♦♦		
3. Recreation / Tourism	♦		
4. Human Habitat	♦		
5. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Slope Stabilization		♦♦♦	
2. Watershed Protection		♦♦♦	
3. Microclimate Stabilization		♦♦	
4. Carbon Sequestration		♦♦	
5. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦
2. Cultural / Spiritual / Aesthetic			♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Juniper Forests (Type 10 / 7)

Forest Products and Services	Economic Values		
Components / Assets	Direct	Indirect	Non-Use
1. Wood Resources (timber, fuelwood)	♦♦		
2. Non-wood Resources (edibles, fodder, medicine, extracts/oils)	♦♦		
3. Recreation / Tourism	♦♦		
4. Human Habitat	♦		
5. Educational and Scientific Uses	♦		
Functions / Services	Direct	Indirect	Non-Use
1. Watershed Protection		♦♦♦	
2. Microclimate Stabilization		♦♦	
3. Carbon Sequestration		♦♦	
4. Slope Stabilization		♦♦	
5. Flood Regulation		♦♦	
6. Soil Fertility Maintenance (Cycling and Fixing of Nutrients)		♦	
Diversity / Attributes	Direct	Indirect	Non-Use
1. Biological Diversity			♦♦
2. Cultural / Spiritual / Aesthetic			♦

Key: ♦ = low ♦♦ = medium ♦♦♦ = high

Forest Products and Services: Marketing and Utilization Trends

- 6.1 The Office of the Inspector General of Forests (OIGF) has long been responsive to the call by policy and planning experts to conduct detailed applied research studies to effectively plan, monitor and evaluate forestry development activities. A significant step was to undertake a series of “Applied Research Studies” supported by the Asian Development Bank (ADB) pursuant to recommendations made at a national workshop as far back as March 1999. The scope of relevant effects to be considered has been extended by policy makers beyond ADB’s focus (on generating consumption and socio-economic data). In particular, the World Bank was guided by the Ministry of Environment in 2006 to produce a valuation study suggesting that environmental degradation costs PKR. 1bn a day (6% of GDP per annum) based on TEVs of **deforestation**, soil salinity, soil erosion, rangelands, water, urban air, airborne lead and indoor air. The World Bank’s 2006 study and WWF-P’s 2008 forest TEV study are reviewed in sections 3.55-3.58 of the present guidelines (literature review).
- 6.2 Economic assessments such as TEVs can provide useful information on the economic efficiency of allocating society’s resources (increased budgetary allocations) to forest conservation. In particular, TEVs underline the high ecological monetary value of different forest types to sharply underline alarming deforestation rates. The forest TEV studies’ PKR estimates are then to be used in comparisons of costs of investment against marginal benefits of interventions such as reforestation and afforestation. For example, based on the National Forest Resource Assessment (NFRA) classification, the 2006 estimated costs of deforestation in Pakistan are between PKR 206m per annum to PKR 334m per annum (World Bank, 2006). The DUVs used in this computation are for local private forests and cover losses from sustainable logging, non-timber products, tourism and recreation. Besides low forest cover, the World Bank explains that the omission of a wide range of NUVs for which “plausible data are unavailable” is responsible for the “relatively low figure of deforestation losses”. It should be noted that two years on the WWF (2008) produced NUV estimates of forest based on application of the Choice Experiment method which may be used to augment the World Bank’s estimate¹. WWF (2008) also estimates IUVs relating to carbon storage values which World Bank (2006) chose not to include, noting that deforestation reduction could be eligible for compensation in the near future. Again, the WWF (2008) IUV estimate which is based on two-year old carbon market prices can be used in this instance to update World Bank’s forest values, ensuring that only the eligible share of forests that can be counted for carbon sequestration are included.

¹ See also Dehlavi A., Groom B., Naseem Khan B. and A. Shahab. 2010. “Non-use Values of Ecosystems Dependent on the Indus River, Pakistan: A Spatially Explicit, Multi-ecosystem Choice Experiment”, Chapter 8 in Bennett J. and E. Birol (Eds.) “Choice Experiments in Developing Countries: Implementation, Challenges, and Policy Implications”, Edward Elgar, Washington D.C., USA.

- 6.3 The present section of the guidelines covers “the existing status of marketing and utilization of forest products and resources”. The terms “marketing” and “utilization” are taken to refer to trends in out-turn of timber and fuel wood (supply side) and wood consumption by the household sector, commercial sector, and industrial sector (demand side). Supply and demand side trends are pertinent to national forest valuation guidelines inasmuch as they impinge on the process succeeding “aggregation”² and extending to extrapolate on a national scale, e.g., the PKR cost of deforestation in Pakistan. That is, besides the different recipes to aggregating individual valuations, or, the differing definitions of the aggregate population, diverse estimates of trends in deforestation at the aggregate and disaggregated levels will impact upon the size of measures aggregating individual valuations.
- 6.4 A review of the statistical records of demand and supply side trends reveals that considerable uncertainties regarding total values can result from two principal sources: (1) in the instance that a range of values are not selected during a “benefits transfer” valuation – the range is needed to overcome uncertainty in applying values obtained in other developing and developed country studies to the Pakistan context; and, (2) in the instance that aggregation is conducted without first addressing the different conventions applied to generate data series as presented by the Federal Bureau of Statistics, the Pakistan Forest Institute, provincial Forest Departments, Ministry of Environment, the Export Promotion Bureau, the State Bank of Pakistan, the Food and Agricultural Organization of the United Nations, the Economic Advisors Wing, Ministry of Finance and the Ministry of Food Agriculture and Livestock, among others.
- 6.5 Besides differing conventions used, base years are adjusted, and, officially available time series data frequently reveal gaps owing to absence of data in given years from provincial forest departments or collection of data on particular units (e.g., certain NTFPs). The result of the application of differing conventions is that time series data from a single source are not consistent and / or comparable, while data is certainly not comparable across different official periodicals in most cases. If it is, accompanying explanatory notes are lacking and only initiated officials and statisticians are aware of how data is to be reconciled. With so basic a figure as forest cover as a per cent of total land area, the Food and Agriculture of the United Nations (FAO) estimates were favored over official government estimates by the World Bank (2006)³.
- 6.6 The data that are presented below in some instances illustrate this source of uncertainty. Their presentation in the guidelines is *not* intended to recommend their use over other studies, nor,

² The term refers to aggregating individual values (PKR estimates of willingness to pay or accept compensation) secured by valuation techniques from the sample frame (i.e., sampled households) upwards to cover the population frame (i.e. the full population to whom direct, indirect and non-use benefits accrue).

³ Official sources place forest resources at about 5% of Pakistan’s territory while the FAO statistics suggest that forest cover declined from 3 per cent in 1990 to 2 per cent in 2006, according to the World Bank (2006) who further note that cover is no more than 4.3% even when irrigated plantations and other wooded areas are included in the calculation.

for that matter to discourage their use. Those overseeing the conduct of studies are simply advised to spend less time reassuring those conducting TEV studies and more time exhorting and hectoring them to develop a justified stance in the face of the uncertainties outlined above.

6.7 Much as it was tempting, the present guidelines refrain from extrapolating the latest data for FY-10, or, presenting demand and supply side forecasts. That analysis is certainly beyond the scope and ToRs of the present guidelines. Data is based on official sources which are cited alongside tables – attention is drawn to the nature of comments accompanying the tables and not how comprehensive or how up to date the data series are. We note that provincial Forest Departments were sent letters via Technical Support Group members and invitees appending clear templates of the data required by WWF. We are grateful to those who responded and shared data, even if this only partially covered template requirements.

6.8 Tables 1 and 2 below cover 10 years plus supply side trends in out-turn of wood and non-wood products respectively.

Table 1: Quantities and Values of Timber and Firewood (FY-93 - FY-07)

Year	Major Forest Products of Pakistan								
	Total			Timber			Firewood		
	Quantity '000 m ³	Value million PKR	% Change in Quantity (+/-)	Quantity '000 m ³	Value million PKR	% Change in Quantity (+/-)	Quantity '000 m ³	Value million PKR	% Change in Quantity (+/-)
FY-93	691	518		371	454		320	64	
FY-94	703	848	2%	187	777	-50%	516	71	61%
FY-95	684	681	-3%	338	616	81%	346	66	-33%
FY-96	720	616	5%	363	616	7%	357	-	3%
FY-97	343	592	-52%	126	478	-65%	217	114	-39%
FY-98	490	688	43%	216	591	71%	274	97	26%
FY-99	383	1,277	-22%	184	1,191	-15%	199	86	-27%
FY-00	868	1,003	127%	425	666	131%	443	337	123%
FY-01	805	1,043	-7%	380	649	-11%	425	395	-4%
FY-02	770	1,575	-4%	363	1,188	-4%	465	387	9%
FY-03	828	1,446	8%	384	962	6%	444	485	-5%
FY-04	620	914	-25%	370	675	-4%	250	239	-44%
FY-05*	1,160	1,461	87%	408	1,144	10%	752	316	201%
FY-06*	1,110	1,608	-4%	632	1,569	55%	478	39	-36%
FY-07*	1,209	1,209	9%	632	951	0%	577	228	21%

Source: Agriculture Statistics of Pakistan - 2003-04, Ministry of Food Agriculture & Livestock; and,

Source*: Pakistan Statistical Year Book 2008, Federal Bureau of Statistics

6.9 As regards Table 1, we note that FBS statistics which cover fiscal years 2005-2007 provide higher quantity figures for both timber and firewood. One potential source for the discrepancy is the inclusion of forest department data which could be altogether missing from the fiscal years 1993-2004 series that is compiled by MINFAL. Alternatively, a base year adjustment may have been made. Either way, in the absence of clarifying explanatory notes in the concerned statistical periodicals, the only recourse is to undertake a lengthy consultation with statisticians

and officials regarding how data was compiled and how to reconcile the FBS and MINFAL series in this instance.

- 6.10 The per cent changes *within* as opposed to *across* either of the two series reveals a common characteristic: volatile troughs and peaks in the volume figures. As this is pronounced for both timber as well as fire wood in the FY-98 to FY-00 period, this hints at a change in the application of statistical conventions. It is not advised to estimate average unit prices based on the quantity and value figures presented in such series without first consulting those compiling the data. It is not always clarified for instance whether these are wholesale values, or, whether state and non-state and non-state forests are both included. Conventions applied by the different provincial departments may differ and so the values or quantities are strictly speaking not useful for average unit value computations at this aggregated level. Changes in average unit prices are perhaps valid or useful only at the market level, or, for assessing changes in the value of wood exports.

Table 2: Quantities of Resin, Mazri and Ephedra (FY-93 - FY-05)

Minor Forest Products of Pakistan (Tonnes)						
Year	Resin	% Change (+/-)	Mazri	% Change (+/-)	Ephedra	% Change (+/-)
FY-93	1,752		39,382		15,067	
FY-94	3,133	79%	67,866	72%	879	-94%
FY-95	716	-77%	45,937	-32%	16,294	1754%
FY-96	2,661	272%	49,719	8%	-	-
FY-97	557	-79%	1,658	-97%	-	-
FY-98	386	-31%	7,709	365%	-	-
FY-99	238	-38%	5,109	-34%	-	-
FY-00	447	88%	3,430	-33%	0	-
FY-01	398	-11%	3,481	1%	1	4905%
FY-02	417	5%	4,887	40%	1	-17%
FY-03	-	-	4,331	-11%	495	53719%
FY-04	385	-	5,516	27%	510	3%
FY-05*	34	-91%	56	-99%	-	-

Source: Agriculture Statistics of Pakistan - 2003-04, Ministry of Food Agriculture & Livestock

Source*: Pakistan Statistical Year Book 2008, Federal Bureau of Statistics

- 6.11 As regards Table 2, the frequent absence of data (e.g., Ephedra for FY-96 to FY-99) is unexplained. The drop in magnitude of volume (e.g., Mazri from FY-96 onwards) is perhaps more likely attributed to a change in statistical conventions than to supply or demand side changes.
- 6.12 As with timber and firewood then, for purposes of aggregation in valuation studies, there are no best practice guidelines as there would be for the issue of aggregation itself (see footnote on

aggregation in section 5.3 above). Only common issues and discrepancies are pointed to above and in what follows.

- 6.13 Table 3 below gives projections that address the demand side, in this case extending to 2013. With the kind assistance of the MoE, we also reproduce projections undertaken by MAANICS Pvt (Ltd), also for the demand-side (see Table 3a below). MAANICS were assigned to conduct a study entitled "Supply and Demand of Fuel wood and Timber for Household and Industrial Sectors and Consumption Pattern of Wood and Wood Products in Pakistan", as part of the ADB's "Strengthening of Forestry Sector" project. The study was completed in 2005. Upon review of MAANICS' raw data sets, we note the comprehensive nature of the study through its use of highly disaggregated series.

Table 3: Projected Consumption of Wood (CY-93 - CY-13)

	Units	1993	1998	% Change (+/-)	2003	% Change (+/-)	2008	% Change (+/-)	2013	% Change (+/-)
Population										
Rural	million	81.4	90.9	12%	101.1	11%	111.6	10%	122.1	9%
Urban	million	41.8	52.5	26%	66.2	26%	83.3	26%	104.7	26%
Total	million	126.8	147.6	16%	172.2	17%	200.6	16%	233.5	16%
Fuelwood Consumption										
Rural	'000 m ³	36,578	40,385	10%	44,587	10%	49,228	10%	54,353	10%
Urban	'000 m ³	6,917	7,636	10%	8,431	10%	3,909	-54%	10,187	161%
Total Consumption	'000 m³	46,455	51,289	10%	56,626	10%	61,521	9%	67,028	9%
Industrial Wood										
Total Consumption	'000 m ³	3,549	4,280	21%	5,339	25%	6,419	20%	7,933	24%
Consumption of all Wood	'000 m ³	50,004	55,569	11%	61,065	10%	68,940	13%	76,967	12%
Sustainable Supplies (all forests)	'000 m ³	8,847	9,506	7%	12,802	35%	16,099	26%	19,395	20%
Required from other Sources	'000 m ³	41,157	46,063	12%	49,163	7%	52,841	7%	57,572	9%

Source: elaborated from Ministry of Environment (2002), Bashir Ahmed Wani, compiled from FSMP 1992 covering all provinces

- 6.14 Table 3 (above) is elaborated from MoE (2002) in that columns tracing growth at five year intervals (CY93-CY98, CY98-CY03, CY03-CY08, and CY08-CY13, respectively) are added. The growth in rural fuel wood consumption is constant, while for urban consumption growth is negative in CY-08 and surges in CY-13. There is an overall increasing trend for all four subcategories under industrial wood consumption. Table 3a (below) presents a projection to 2018 that is based on a more conservative population growth rate (1.94%) as compared to Table 3. The projections tally for the constant increasing growth for industrial and commercial categories, while there is no decline in urban fuel wood consumption between CY-03 and CY-08 in Table 3a. Absolute quantities for urban and rural consumption are considerably lower in Table 3a as compared to table 3.

Table 3 (a): Projected Consumption of Wood (National)

Items	Units	2003	2008	2013	2018
Population	Million	153.73	169.23	186.30	205.08
Industrial Timber	000 m ³	12238	13472	14831	16326
Industrial Fuelwood	000 m ³	4703	5177	5699	6274
Commercial Fuelwood	000 m ³	1046	1152	1268	1395
Domestic/HHs:					
Fuelwood	000 m ³	25773	28372	31232	34382
Rural	000 m ³	23557	25932	28547	31426
Urban	000 m ³	2216	2440	2685	2956
Total Fuelwood	000 m³	31522	34701	38200	42051
G. Total	000 m³	43760	48173	53030	58377

Source: MAANICS (2005)

- 6.15 For our purpose, and following ToRs for the present guidelines, we now address briefly micro-level data needs for administration of household level valuation surveys. While designing DUV survey instruments, the following can be expected to be covered in the Pakistan context:
- (a) collection of wood products and associated input costs;
 - (b) sale / transaction and consumption of wood products;
 - (c) NTFPs but also “by products of hunting” such as mustard seed and cotton which are planted expressly to attract game; and,
 - (d) enterprise based on the wood products, NTFPs and by-products of hunting.
- 6.16 For (a)-(d), it is important to clearly identify seasons in the survey instrument. Amounts collected in (a) should specify units of measurement which themselves should leave options open for respondents to specify the units. The notion of a “typical trip” in the context of collection may be used and should clearly be defined in the pilot phase and explained clearly also to respondents. Also in relation to (a), allowance should be made, depending on the season, for additional inputs including the rental of vehicles for large one-off collection efforts.
- 6.17 As regards (b), it is important to distinguish between household prices and market prices received. Comparison of prices with previous years is necessary and questions to this effect should be included. For each type of wood, the respondent should be prompted to identify substitutes for the product.
- 6.18 As regards (c), as with (a), it is important to note which members of the household / others undertake the trip, as well as how frequently the person collecting is accompanied. Effort should

be categorized in terms of time taken (both to travel and to collect) as measured in minutes (to be converted later into PKR measure of opportunity cost of time), transport cost, resource cost, and other costs (measured in PKR). It is important to note the use of the item and the level of own consumption which will be deducted from sales.

6.19 As regards (d), numbers and corresponding units for what is produced and sold (price per unit is needed here) must be clearly asked. Inputs used in the production process should be defined in terms of their source and total associated cash expenses.

6.20 These general guidelines cover a circumscribed but essential set of eventualities that those designing DUV surveys are expected to confront. It is beyond the scope of the present guidelines to cover the kinds of micro-level data needs that should be built into NUV and IUV survey instruments. The guidelines here do illustrate the need for precision in characterizing phenomena and obtaining unambiguous responses from respondents which is common to all forest valuation survey instruments.