ANNEX 3

Annex 3a: Other detailed methodological descriptions for agriculture

Enteric fermentation

Dairy Cattle

The herd of dairy cattle has been disaggregated into 18 subgroups, ranging from dairy cattle with less than 1000 kg of milk yield per year to those with more than 9000 kg of milk per year. Since the Statistical Office of the Republic of Slovenia does not have data on the distribution of the herd as to its milk production, data of the Cattle-Breeding Service of Slovenia, monitoring approximately 30 % of the total herd (Verbič, Sušin, Podgoršek 1999, p. 4-5), have been used.

Table: Distribution of animals with regard to the quantity of produced milk per year.

Milk yield	N U M B E R O F A N I M A L S (in 0 0 0)									
per year	1985	1986	1987	1990	1991	1992	1993	1994	1995	1996
<1000	0.3	0.4	0.4	1.0	0.5	0.5	1.9	0.9	0.7	1.0
1000-1500	34.5	29.9	32.5	34.5	20.0	26.3	37.6	28.2	24.3	28.1
1500-2000	72.6	62.2	63.3	72.6	43.8	50.5	52.4	48.2	44.8	46.6
2000-2500	68.6	64.6	61.6	68.6	51.4	50.8	43.5	46.3	45.8	44.1
2500-3000	41.3	45.6	40.9	41.3	42.6	36.0	28.0	32.6	33.9	31.0
3000-3500	19.6	25.5	22.2	19.6	29.1	21.9	16.7	20.0	21.9	19.4
3500-4000	8.5	12.4	11.2	8.5	17.9	12.9	10.1	12.3	13.7	12.0
4000-4500	3.8	5.8	5.5	3.8	10.2	7.5	6.3	7.7	8.9	7.9
4500-5000	1.9	2.8	2.9	1.9	5.7	4.5	4.1	5.1	5.9	5.7
5000-5500	1.0	1.4	1.6	1.0	3.3	2.9	2.9	3.6	4.1	4.1
5500-6000	0.5	0.8	1.0	0.5	2.0	2.0	2.1	2.5	3.1	3.2
6000-6500	0.4	0.5	0.7	0.4	1.4	1.3	1.5	1.8	2.2	2.4
6500-7000	0.2	0.3	0.5	0.2	0.9	1.0	1.2	1.4	1.7	1.9
7000-7500	0.1	0.2	0.3	0.1	0.7	0.7	0.9	1.1	1.3	1.5
7500-8000	0.1	0.2	0.2	0.1	0.5	0.5	0.5	0.7	1.0	1.1
8000-8500	0.1	0.1	0.2	0.1	0.3	0.3	0.4	0.5	0.7	0.8
8500-9000	0.0	0.1	0.1	0.0	0.1	0.2	0.2	0.3	0.4	0.5
>9000	0.0	0.1	0.1	0.0	0.2	0.2	0.2	0.3	0.6	0.7
Total:	253.6	252.8	245.2	253.6	230.5	219.8	210.4	213.5	215.0	212.1

Based on data from controlled cows (the monitoring service performs monthly measurements of the milk yield of every individual cow) it has been ascertained that the distribution of annual milk yield best fits a gamma function. For the controlled herd, parameters of gamma distribution have been calculated for each individual year. On the basis of the number of cows under control and their average milk yield (Cattle-Breeding Service of Slovenia) and on the basis of data on the total population of cows and the amount of produced milk (Statistical Office of the Republic of Slovenia), to which was added the milk that was suckled by suckling calves[1], the number of non-controlled cows and their average milk yield have been calculated. Then, assuming that the form of distribution of the milk yield of non-controlled cow population was equal to the form of distribution of controlled population, the degree of gamma function was coordinated by means of an iterative method in such a way that the average milk yield of

[1] Statistical Yearbooks state annual quantities of milked milk. That quantity includes the milk milked and fed to calves, but not the milk that the calves suckle. Data on the number of suckling calves are not available; consequently, we estimated that all calves, the mothers of which have less than 2000 kg of milk per year, suckle. It was considered that an average suckling calf drinks 600 kg of milk.

a theoretical non-controlled population was equal to the milk yield, which was calculated on the basis of statistical data. Both cow populations, the controlled and the non-controlled population, have then been mathematically combined. An example of a distribution of both separate populations and the combined population for 1996 is presented in the graph, while the theoretical distribution of the herd for all years in question is presented in the enclosed table.

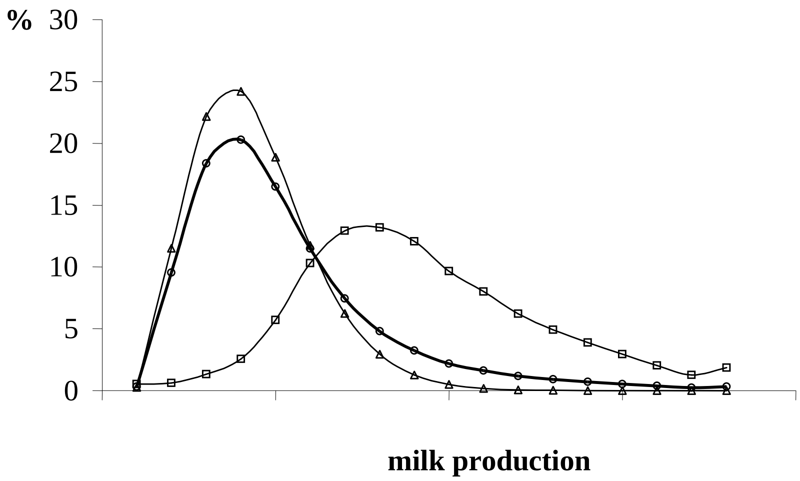

Figure 1: Theoretical distribution of the controlled herd (□), adjusted non-controlled herd (Δ) and the entire, mathematically combined herd (○) of dairy cows

For a precise estimate of the quantity of emitted methane, it is necessary to also know the quantity and quality of feed intake. For dairy cattle with a yield from 1000 to 9000 kg of milk annually, feed intakes for various lactation phases have been calculated. The posible feed intake has been estimated according to Menke and Huss (1987), while for covering the energy requirements, the German system (DLG, 1997) has been used, which was adapted in such a way as to accommodate the requirements for pregnancy and the possibility of drawing upon and storing body reserves. In doing so we considered the fact that breeders feed cows which give the least milk (1000 to 3000 kg/year) only hay harvested from heading until flowering, that cows from 4000 kg upwards are also fed corn silage, from 6000 kg upwards also grass silage, cut in the phase before the heading stage. The diets were, in accordance with standards, supplemented with concentrates. Based on average digestibility factors for organic matter and using equations for conversion of digestibility of organic matter to digestibility of energy, equations for estimating digestible energy (pE, in %) in relation to milk production (L, in kg per yr) have been composed:

$$pE = 52.22 + 0.0039\ L + 0.0000002\ L^2$$

This equation has served as the link between the German NEL system, which is used in this country, and the American NEL system, on which the IPCC methodology rests. IPCC methodology is used in estimating gross energy intake. Net energy is estimated on the basis of the needs of animal for maintenance, lactation, and pregnancy. In case of grazing animals, additional energy requirements for grazing has been taken into account. Calf birth weight has been calculated according to the IPCC method. The total requirements, expressed as net energy, have been converted into gross energy requirements. To do that, the laid-down equations (IPCC, 1997) as well as the equation for estimating the required digestibility of energy with regard to the milk yield of an animal, adapted to the prevailing conditions in Slovenia, were used.

The requirements of animals for net energy and all emissions arising from the quantity of feed intake have been calculated for each of the 18 subgroups. In doing so, it has been taken into account that animals which produce more milk also have higher body weight than animals with lower milk production. With regard to the latter, the body weight in individual classes has been estimated according to this equation:

$$\text{Body Mass (kg)} = 418.8 + 0.03125 \times L$$

where coefficient L = annual milk production in kg.

The mass of cows estimated in this manner was similar to the estimates that were given for cows slaughtered in Slovenian slaughterhouses by the Statistical Yearbook of the Republic of Slovenia. In calculating the standard values, the measured fertility of the controlled population (database of the Cattle-Breeding Service of Slovenia) has been taken into account for each class individually. Fertility ranged from 0.8 to 0.9 calves per year, decreasing for increasing milk yield.

Annual emissions of methane ($E_{M\ ENTER}$) have been calculated on the basis of estimated gross energy intake (BE) according to an equation taken from the pages of IPCC (1997):

$$E_{M\ ENTER}\ (\text{kg/year}) = \frac{\text{BE (MJ/day)} \times Y_m \times 365\, days/year}{55{,}65\, MJ/kg\ \ methane}$$

The coefficient Y_m in equation 3 is the methane conversion factor, which defines the fraction of the gross energy intake that is converted into methane. The methane conversion factor decreases for increased digestibility. For cows with less than 3000 kg of milk per year the methane conversion factor of 0.07, for higher milk yield, the methane conversion factor of 0.06 has been applied.

On the basis of the results for 18 subgroups an equation for direct prediction of methane emissions (E_M in kg CH_4 per animal per year) on the basis of annual milk production (M; in kg of milk per animal per year) was developed (Tomšič in sod., 2000).

E_M = 75.7 + 0,0038 x M

Manure management

Table 1: Characteristics of slurry handling on large pig production farms in 2000. Data are presented separately for each of the 4 characteristic groups*.

Farm groups, with regard to type of slurry handling	Fraction of swine in % of all swine on large farms**	Fraction of VS with regard to the type of storage or usage: Solid manure	Slurry	Biogas	Lagoon
Biogas 1	19 %	80 %	0 %	20 %	0 %
Biogas 2	26 %	60 %	0 %	30 %	10 %
Slurry separation and treatment in lagoon	21 %	40 %	0 %	0 %	60 %
Slurry separation and slurry spreading on agricultural soils	34 %	50 %	50 %	0 %	0 %
TOTAL:					
Estimate for 2000		56 %	17 %	12 %	15 %
Estimate for 1986		20 %	20 %	0 %	60 %

*- Considering the fact that the new wastewater treatment plant on the Farm of Nemščak, which has been inaugurated in the spring of 2001, had operated already in 2000. The aim of this research project was to ascertain the present condition and the fact is that the treatment plant is operating.
**- The fraction has been estimated on the basis of data from the Pig-breeders Association (GIZ Prašičereja)

Annex 3b: Other detailed methodological descriptions for LULUCF

National Forest Inventory 2007 (NFI 2007)

Methodology

When designing NFI 2007 for KP/UNFCCC reporting purposes, recommendations of GPG 2003 and COST Action E43 have been considered as far as possible. If NFI will be repeated in five years time (in the year 2012), its design and methodology will offer reliable data sets about volume of wood growing stock; state, changes (increment, felling) – development/trends – of all Slovenian forests.

Convention on long range transboundary air-pollution (UN/ECE 1979) presents the legislative framework for ICP monitoring scheme - Assessment and Monitoring of Air Pollution Effects on Forests (FCS - inventory in the year 2000). FCS as it is defined in Official Journal of the Republic of Slovenia (Official Journal of the RS, nr. 92/00, 56/06), presents basis for development of Slovenian national forest inventory 2007 (NFI 2007) design.

Assessment methodology is supplemented according to the findings of test inventory, which was carried out in the year 2006 on 43 sample plots (16 x 16 km sampling grid). NFI 2007 was performed on 778 sample plots in forests, organized by 4 x 4 km sample grid which covers the whole Slovenian territory

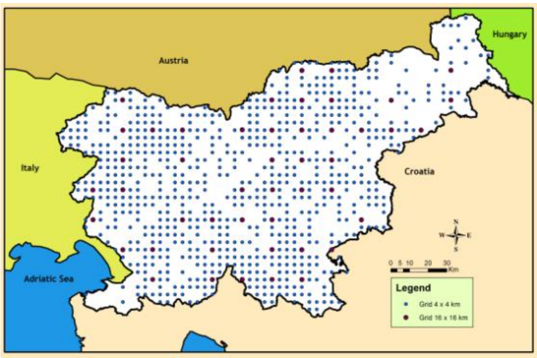

Figure 1: Arrangement of NFI 2007 sample plots on 4 x 4 km sample grid (●) and 16 x 16 km sample grid (●)

Arrangement of NFI 2007 sample plots principally remained the same as in the inventory in the year 2000 – FCS. Basic sample unit plot of NFI 2007 is CPP As written before the CPP is spatially identified by the geographical coordinates of the centre of the CPP, which is positioned 50 meters west from the base sample grid section (integer number of coordinates). Neither plots nor trees are visually marked with numbers, letters etc., so the inventory results and data remain representative due to unbiased forest management practice carried on in stands with sampling plots. Statistically, the NFI 2007 was characterized as a systematically single stage sampling.

Due to changes in FCS protocols and additional field data that were obtained, the design of CPP (2007) was changed in respect to the design of inventory in the year 2000. Inner concentric plot for volume of growing stock of small trees ($D_{1,3}$ > 0 cm) assessment was added. Basic characteristics for all 4 concentric plots which CPP is composed of are shown in Figure 2.

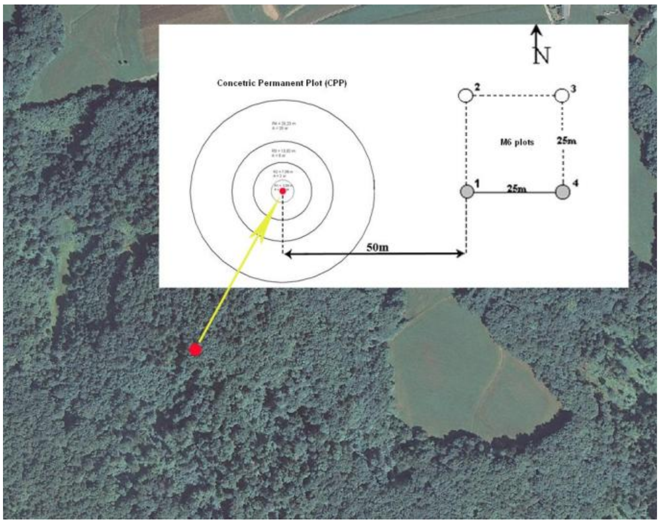

Figure 2: Scheme of CPP (on 16 x 16 km grid – CPP + all four M6 plots; on 4 x 4 grid – CPP + M6 plots nr. 1 and 4)

Table 1: Critical values for assessing living and dead tree wood stock on CPP in NFI 2007

Plots	CPP_1	CPP_2	CPP_3	CPP_4
Radius (R) of the plots [m]*	3,09	7,98	13,82	25,23
Area (P) of the plots [ar]	0,3	2	6	20
Characteristics of stand and site	Area of 20 ar			
Standing live trees	$D_{1,3}$ > 0 cm H ≥ 1,3 m	$D_{1,3}$ ≥ 10 cm	$D_{1,3}$ ≥ 30 cm	/
Standing dead trees	$D_{1,3}$ ≥ 10 cm		$D_{1,3}$ ≥ 30 cm	
Lying dead trees	$D_{1,3}$ ≥ 10 cm		$D_{1,3}$ ≥ 30 cm	
Stumps	D ≥ 10 cm H ≥ 20 cm		/	
Snags	D ≥ 10 cm H ≥ 50 cm		D ≥ 30 cm H ≥ 50 cm	
Coarse woody debris – woody parts of trees (branches, parts of stem etc.)	D ≥ 10 cm L ≥ 50 cm		D ≥ 30 cm L ≥ 50 cm	

*Reduction of plot area regarding to terrain slope should be considered when defining radius of the plots!

Field work and assessment on CPP

Field work – measurements and assessment – on CPP in NFI 2007 consists of:

- detailed description of the plot (assessment of the site and stand),
- measurements and assessment of trees (diameter/circumference at breast height, distance and azimuth from the plot's centre to every measurable tree, tree species, social/height class, defoliation, height and age of the three thickest trees, tree status regarding to type of growing stock/biomass (living, dead, standing, lying), tree status code – present in both assessments (in the years 2000 and 2007), cut down/felling, dead etc.),
- measurements and assessment of dead wood (type of dead wood, diameter and length /height, tree species, decay class).

Dead wood assessment

Dead trees (fallen or still standing) are measured regardless of bark being present or not. Lying dead trees are measured if their diameter at breast height ($D_{1,3}$ – from the beginning of a stem) lies inside of a critical plot radius and is bigger or equal 30 cm (see examples 1, 2 and 3). Dead tree still has to have branches, so it can be recognised as a tree. If branches are no longer attached to a tree, it is treated as a large wooden piece. If a larger wooden piece lies on plot partially (example 5), only the part inside the critical radius is taken into consideration (length (L) and mean diameter (D) are measured). All critical values from the are also considered.

Stump is measured if its centre (see, example 6) is within the critical plot radius. Furthermore the following has to be considered:

- for stumps which lay on slope terrain or are of different shapes, upper and lower height is measured and mean value of the height (H) is calculated. Mean diameter (D) is also calculated for the bigger and smaller diameter.
- where roots were pulled out from soil, or if they grew above litter level, only stump without roots is measured.

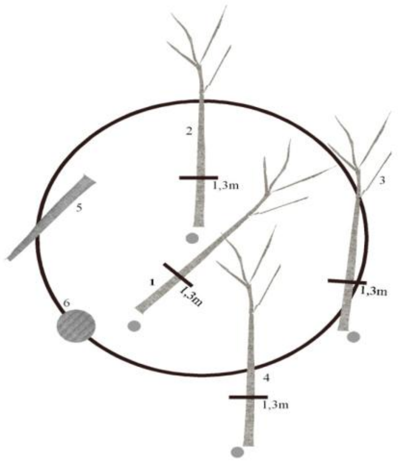

Figure 3: Examples of laying dead trees and stumps

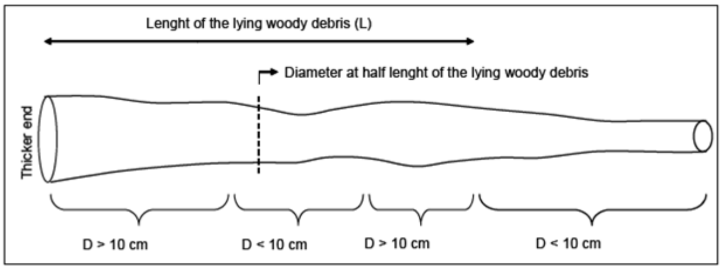

Figure 4: Example of a larger deadwood piece (length is measured from the thicker end to the thinnest end with D ≥ 10 cm)

Basic information about NFI 2007

Slovenian Forestry Institute (SFI) had lead the activities of NFI 2007 but the field work had been carried out mostly by the field crews composed of Slovenia Forest Service (SFS) staff and students.

Characteristics of NFI 2007 are:

- sample grid 4 x 4 km, 778 circular permanent plots (CPP),
- field work performed: July and August 2007,
- 35 field crews of SFS (inventory on plots on 4 x 4 km grid),
- 3 field crews of SFI (inventory on plots on 16 x 16 km grid, training of SFS field crews, control check and quality assurance – on 5 % of all plots),
- field crew mainly consists of one leader (university forest engineer) and one unskilled assistant (student).

Basic field crew equipment:
- handy GPS device for satellite navigation,
- measurement tape for diameter/circumference and distance measuring,
- diameter calliper,
- compass with stand-pole,
- Vertex instrument,
- tree height measurement instrument,
- inclinometer,
- field manual, data entry forms, code sheets, plot access maps.

Description of work in NFI 2007

Activities in NFI 2007 were carried out in following order:
- NFI 2007 field protocol preparation:
    - study of international protocols and requirements (KP, GPG 2003, COST E43) and harmonization of their demands (basis was the inventory performed in the year 2000),
    - harmonization of data sets which were later obtained in field between SFS, Ministry of agriculture, forestry and food (MAFF) and Ministry of the Environment and Spatial planning (MESP) (agreement on the set of field data, field crews, financing, equipment etc.),
    - defining of NFI 2007 concept (statistical design, sample grid, standards of quality and measurements, area of plots, algorithms etc.),
    - final edition of the NFI 2007 field protocol.
- Preparation of plot access information and data entry forms:
    - setting of spatial information system with all available information layers (topography, digital ortho-photo, theoretical plot coordinates, land use data for the year 2000 by the MAFF – forest/non-forest land etc.),
    - spatial control if all existing CPP are inside forests and adding of new plots regarding to land use data (MAFF),
    - preparation of the assessment data from the inventory in the year 2000 and printing data entry forms with data from the year 2000,
    - field testing of the protocol (plot access map, data entry forms, protocol, equipment etc.),
    - preparation and printing of data entry forms (stand, plot, trees, small living trees, dead wood),
    - preparation and printing of plot access information (maps and description of access),
    - preparation and printing of code sheets (stand, plot, trees, small living trees, dead wood),
    - printing of NFI 2007 field protocol,
    - equipment purchase (examination and completion of equipment for SFI and SFS).
- Course and training for SFI and SFS field crews
    - preparation of the field crews list (SFI and SFS), course attendance for field

workers in June was obligatory,
    - preparation of the programme and realization of the 4-day course and training (19.-22.6.2007, 50 attendees).
- Field measurements:
    - introducing SFS field crews into *in-situ* field work: 3 SFI field crews had visited each one of SFS field crews at the beginning of work and carried out the complete protocol of assessment in at least one of the plots,
    - field assessment on 760 plots of 4 x 4 km grid (35 SFS field crews),
    - field assessment on 40 plots of 16 x 16 km grid (3 SFI field crews),
    - resolving of actual problems that appeared on field assessments,
    - re-measurement for quality control purposes: 3 SFI field crews (5 % or 40 plots).
- Data entry:
    - preparation of FoxPro forms for entering data into NFI 2007 data base,
    - preparation of data entry manuals and short training course of data entry staff (4 students),
    - data entry and on-line control of data entry process.
- Data processing:
    - manual and logical checks of all entered data are carried out,
    - preparation of algorithms and programs for data calculation (volume of wood growing stock calculation, increment, volume of dead wood stock),
    - the final thorough quality check, data processing and preliminary results.
- Data management:
    - Plot's access maps, data entry forms (filled) and NFI 2007 data base had been in physical and in digital forms archived. Security back-up of all NFI 2007 data base, which is located on SFI server, is made on regular basis.

Quality assurance

All field crews had to attend training course where field measurement protocol was exhaustively presented. When actual field work started, SFI crews visited each SFS crew and carried out the whole procedure side by side in search for eventual misconceptions of the protocol. In the end, SFI crews re-assessed 40 plots (or at least 5 % of all plots) and evaluated the quality of field work.

Volume estimation

For **volume of tree calculation** (m^3) locally used tariffs are used as for:
- a single tree **tariff's code** (01-60) is selected from SFS forest's compartment data base respectively 8 different **tree species groups** (T_1-T_8). Tariff's **type** (equation) and class (coefficient) are defined by the tariff's code selection.
- the volume of tree is calculated using appropriate tariff's equation (type, class) with tree **diameter** ($D_{1,3}$) as explanatory variable,
- Tariff functions give values for volume of stem over bark (including stem parts (branches) with a diameter of more than 7 cm and a stump).

Equations:
Diameter ($D_{1,3}$) = Circumference ($O_{1,3}$) / π

Three different tariff's **types** (4 equations) and **20 tariff classes** with different coefficients (v_{45}) are used as for:
- even-aged stand/forest, slow Schaeffer's E tariffs

$$v = \frac{v_{45}}{1800} * d_{1,3} * (d_{1,3} - 5) = \frac{v_{45}}{1800} * (d_{1,3}^{2} - 5 * d_{1,3})$$

- selective stand/forest (germ.: *plenterwald*), rapid Algan's P tariffs

$$v = \frac{v_{45}}{1400} * (d_{1,3} - 5) * (d_{1,3} - 10) = \frac{v_{45}}{1400} * (d_{1,3}^{2} - 15 * d_{1,3} + 50)$$

and for trees which diameter ($D_{1,3}$) is thinner than 25 cm:

$$v = \frac{v_{45}}{1400} * (-226,33 + 38,575 * d_{1,3} - 1,9237 * d_{1,3}^{2} + 0,04876 * d_{1,3}^{3})$$

- uneven-aged stand/forest, intermediate Čokl's V tariffs

$$v = \frac{v_{45}}{1600} * (d_{1,3} - 2,5) * (d_{1,3} - 7,5) = \frac{v_{45}}{1600} * (d_{1,3}^{2} - 10 * d_{1,3} + 18,75)$$

Table 2: Tariff's coefficients

	TARRIF'S CLASS from 1 to 10 (5)									
10 CLASSES	1		2		3		4		5	
20 CLASSES	1	2	3	4	5	6	7	8	9	10
k = v_{45}	1,143	1,200	1,263	1,326	1,396	1,466	1,543	1,620	1,706	1,791

	TARRIF'S CLASS from 6 to 20 (10)									
10 CLASSES	6		7		8		9		10	
20 CLASSES	11	12	13	14	15	16	17	18	19	20
k = v_{45}	1,885	1,979	2,084	2,188	2,303	2,418	2,546	2,673	2,814	2,954

Calculation of **volume of small trees** (m^3):

- Volume for single small tree is calculated by Huber's equation (see equation below),
- Volume of single small tree is then multiplied by the number of trees (N) which have the same $D_{1,3}$ and H.

Equations:

Basal area (G) = $\pi * (D_{1,3} / 2)^2$

$V = G * H = \pi * (D_{1,3} / 2)^2 * H$ (Huber's equation – volume of cylinder)

Calculation of **volume of dead wood** (m^3):

- the choose of appropriate method (tariff's or Huber's equation) for volume of dead wood calculation is dependent on **type of dead wood** as for:
  - **tree** (standing dead tree, lying dead tree) calculation is the same as for living tree (using tariff's equations, see upper),
  - **stump**: from diameter (D) and high (H), by Huber equation (V = G * H),
  - **snag**: from diameter (D) and high (H), by Huber equation (V = G * H),
  - **coarse woody debris**: from diameter (D) and length (L), by Huber equation (V = G * L).

Equations: see above!

Growing stock estimation

Calculation of **volume of wood growing stock** per sample plot (m^3/ha):

- to calculate volume of tree per ha (from m^3 to m^3/ha) volume of tree is multiplied by area factor (FP),
- area factors (FP) are calculated on the basis of sample plots areas (P) and are for trees that have diameter ($D_{1,3}$) respectively:
  - from 10 to 29,9 cm: P_2 is 200 m^2, FP_2 is 50,
  - equal or bigger than 30 cm: P_3 is 600 m^2, FP_3 is 16,7,
  - for dead standing tree (code is 2) diameter must be equal or bigger than 30 cm: P_4 is 2000 m^2, FP_4 is 5.

Calculation of **volume of growing stock of small trees** per plot (m^3/ha):

- to calculate volume of small trees per ha (from m^3 to m^3/ha) volume of small trees is multiplied by area factor (FP): P_1 is 30 m^2, FP_1 is 333;

Calculation of **volume of dead wood stock** per plot (m^3/ha):

- to calculate volume of dead wood per ha (from m^3 to m^3/ha), volume of every single piece of dead wood is multiplied by different area factors (FP) according different types of dead wood,
- area factors (FP) are calculated on the basis of the sample plots areas (P) and dead wood types as for:
- **tree** (standing dead tree, lying dead tree), if diameter ($D_{1,3}$) is:
  - from 10 to 29,9 cm: P_2 is 200 m^2, FP_2 is 50,
  - equal or bigger than 30 cm: P_4 is 2000 m^2, FP_4 is 5.
- **stump**: P_2 is 200 m^2, FP_2 is 50,
- **snag**, if diameter (D) is:
  - from 10 to 29,9 cm: P_2 is 200 m^2, FP_2 is 50,
  - equal or bigger than 30 cm: P_4 is 2000 m^2, FP_4 is 5.
- **coarse woody debris,** if diameter (D) is:
  - from 10 to 29,9 cm: P_2 is 200 m^2, FP_2 is 50,
  - equal or bigger than 30 cm: P_4 is 2000 m^2, FP_4 is 5.

Biomass and carbon stock estimation

How to calculate amount of biomass and carbon from volume of growing stock?

Above-ground biomass (AGB):

- growing stock (GS) (m^3/ha) * forest area (ha) → (m^3)
- from GS to carbon stock in AGB (tree species)
  - biomass expansion factors (BEF): GS (m^3) → AGB (m^3)
  - wood density (WD): AGB (m^3) → AGB (t)
  - biomass/carbon factor (CC): AGB (t) → CDWB (t)

Below ground biomass (BGB):

- input data: AGB (t)
- from AGB to carbon stock in BGB (tree species):
  - root-shoot ratio (R): AGB (t) → BGB (t)
  - biomass/carbon factor (CC): BGB (t) → CBGB (t)

Dead wood biomass (DWB):

- dead wood stock (DWS) (m^3/ha) * area (ha) → (m^3)
- from DWS to carbon stock in DWS (tree species):
  - wood density (WD): DWB (m^3) → DWB (t)
  - biomass/carbon factor (CC): DWB (t) → CDWB (t)

As some research studies for national BEF factors for the main tree species are planned to be done in time period 2008-2012, basic wood density (WD) was gained for the main tree species from literature and some research studies as well as from table 3A.1.9 (GPG 2003). BEF **factors are from GPG 2003:**

Table 3: Factors used in calculation (according to GPG 2003)

	D	BEF_1	R	BEF_2	CF
Coniferous	0,407	1,15	0,32	1,35	0,5
Deciduous	0,567	1,20	0,26	1,36	0,5

Increment estimation

The national forest inventory which will be repeated in 2012 will make reliable calculation of growing stock increment possible. Increment can already be derived now from the years 2000 and 2007 inventory data.

Drain statistics estimation

The national forest inventory which will be repeated in 2012 will offer basis for reliable felling assessment, because every tree has appurtenant location data. Plots are not visually marked in any way so they reflex actual management practice.