

## 8. LAND RECLAMATION, BIOLOGICAL DIVERSITY AND LANDSCAPE

### 8.1. REGULATION OF WATER REGIME

When drainage or irrigation is applied, natural water circulation is disturbed and this certainly affects concentration of biogenic materials in water. Surplus of biogenic materials (compounds of nitrogen and phosphorus) in surface waters and in sources of drinking water is harmful for aquatic fauna and human health. Therefore, during regulation of water regime it is very important to protect ground and surface water from pollution. Pollution of drinking water by nitrates is especially dangerous.

The dominant drainage type of fields in Lithuania is tile drainage, and ditches are used for this purpose only in small amount. Land reclamation works were carried out in complex installing not only tile drainage or open drainage network but also many small hydrotechnical constructions that ensure reliable operation of drainage systems.

When reclamation equipment gets out of order, they need reconstruction. This is very expensive measure compared to annual expenditure for exploitation, so land users have to know that maintenance of drainage systems is very important.

Right usage of watering installations is also very important as they can be of benefit only then. If they are explored improperly they are not only unprofitable but they can damage soil and pollute surface waters.

Problems of drinking water are very urgent in the countryside as water is usually taken from drilled wells; therefore, adequate installation of sources of drinking water, their maintenance and protection from pollution are very significant. If we drink only pure water, we will not impair our children's and our health.

#### 8.1.1. Tile drainage and its maintenance

##### 8.1

**Landowner is responsible and he can not impede to ensure functioning of land reclamation facilities in adjacent lands<sup>1</sup> and also has not to violate the rights of other users of water resources.<sup>2</sup> Every earthwork and construction of new buildings in drained areas must be co-ordinated with State Land Reclamation Service.<sup>3</sup>**

##### 8.2

**Landowner should be responsible for:**

- **proper usage and maintenance of drainage systems;**
- **quality of water flowing from the drainage systems to adjacent territory;**
- **damage of the drainage systems and pollution of water in the drainage systems.**

In order to meet the above mentioned requirements and to cultivate drained land it is recommended:

1. Not to use fertilisers (organic and mineral) and not to drive to fields with machinery when soil is so wet that machines stick in, because then fertilisers percolate with water to deeper layers quickly and get into drainage, and the sticking machines may break up drainage tubes;
2. To use household wastewater and liquid manure for watering of drained land only after consulting a specialist;
3. After the end of flood season it is needed:

<sup>1</sup> Republic of Lithuania. Law on Land Reclamation, 1993, V.

<sup>2</sup> Republic of Lithuania. Law on Water, 1997, V.

<sup>3</sup> Republic of Lithuania. Law on Land Reclamation, 1993, V.

- To check if drainage systems operate sufficiently well and if all the area is evenly drained;
- To check if pits of funnel or other form and gullies have not appeared in the area (this is a sign of ground suction in the places of drainage damage or result of water erosion because of obstruction of drainage pipes);
- If surface runoff inlets operate well;
- If there are no water erosion signs;
- To perform established maintenance work.

If the mentioned damages are observed, they have to be eliminated without delay. One drainage system drains land of some farmers usually. If we take care only about ourselves, our neighbours will suffer.

### 8.1.2. Ditches and surface drainage

#### 8.3

Coastal protective strips are established at surface water bodies.

For regulated rivulets and reclamation ditches, which have basin area smaller than 10 km<sup>2</sup>, width of the preservation strip is determined depending on local conditions:

When inclination of riverside is up to 5 degrees – 1 m;

When inclination of riverside is 5-10 degrees – not smaller than 2.5 m;

When inclination of riverside is more than 10 degrees – not smaller than 5 m.<sup>4</sup>

On coastal preservation strips it is prohibited: to build buildings (except for hydrotechnical ones), lay roads, use fertilisers, pesticides and other chemicals harmful to environment, cultivate land, destroy turf, graze cattle, arrange recreation places, leave a car, make up a fire, cut trees and bushes.

#### 8.4

Landowner must:

- maintain a ditch that goes through his land in order to create conditions for draining of adjacent areas;<sup>1</sup>
- not violate requirements of preservation strips and zones.<sup>5</sup>

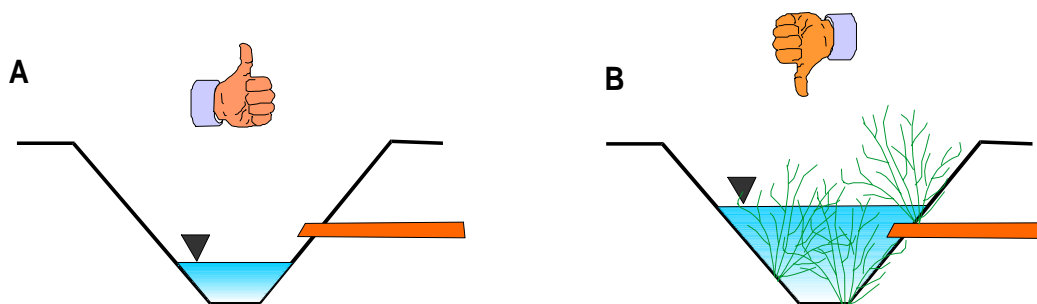


Fig. 8.1. Water level during vegetation season when ditch is maintained properly and improperly

The ditch will fully perform its duty and will not harm nature if a landowner carries out the following works:

- puts washed out or slipped slopes and gutters for surface water inlet to the ditch in order in every spring and autumn;

<sup>4</sup> Regulations on formation and maintenance of preservation zones for water bodies, LTSR MT 1982 12 06 resolution No. 335

<sup>5</sup> Special conditions on forest and land use. LRG 1992.05.12, Resolution No. 343. V.

- mows grass at slopes and protective strips in time;
- does not let bushes grow on slopes of the ditch;
- does not let livestock to the ditch and avoids any other damage of the slopes;
- removes appeared obstructions from the ditch bed (e.g. remnants of trees and bushes);
- if needed, cleans openings of hydrotechnical constructions (bridges, gutters, top streams, etc.) and creates conditions for free water flow.

### 8.1.3. Irrigation

Sprinkler irrigation systems have become most spread and established among other irrigation systems in Lithuania. Irrigation systems are most common for vegetables and cultivated pastures. Irrigation is very effective in dry summers but it may also cause harm if used improperly.

#### 8.5

**When sprinkler irrigation technique is used, such watering intensity should be chosen that water would have time to soak into soil and surface runoff would not be formed, which would induce erosion and washout of nutrients and humus.**

During exploitation of sprinkler irrigation system it is important to water out such amount of water that will be absorbed by that soil layer where plant roots are present. If we water too strong (too intensively) then soil will not have time to absorb the water coming to the surface and bogs will be formed. If we water too long then water will percolate deeper than roots and will leak to drainage (we will have unnecessary water losses). Water flowing from higher places to lower will take away nutrients and humus. All this may be avoided if engineer hydrotechnician is called, project of detailed irrigation regime is prepared, and the amount of water for irrigated crop per whole season and per one watering period is determined. It is not recommended to water if surface slope is more than 2 %.

Besides sprinkler irrigation there could be used surface irrigation by small furrows and drop irrigation. The surface irrigation suits to row crops. Drop irrigation is very promising. Its key point is that a small tube is brought to each plant and the water amount needed for the plant drips from the tube. Such irrigation system is usually used in kitchen gardens and gardens. If liquid manure and household wastewater are planned to be used for watering, one has to be especially careful and consult specialists necessarily.

### 8.1.4. Sources of drinking water

*Drinking water means fresh water, extracted from natural sources or specially prepared that meets the standard for drinking water established in the Republic of Lithuania.*

*Water extraction site means an area where water is extracted for the purpose of supplying it to users. Sanitary protective zone around the water extraction site (SPZ) denotes the protected area surrounding the water extraction site, which is subject to certain limitations imposed on the activities of land users.*

#### 8.6

**Drilled and dug wells located in the territory of land user are sources of drinking water and laws regulate their protection.<sup>6</sup> Sanitary protective zones and strips shall be designated around the water extraction sites and single wells; economic activities shall be regulated or prohibited there.<sup>7,8</sup>**

<sup>6</sup> Lithuanian Republic. Law on Water, 1997.

<sup>7</sup> Special conditions of forest and land use. LRG 1992 05 12, resolution No. 343

<sup>8</sup> Order on design, installation, preservation and liquidation of bore wells for water supply and thermal energy use. LAND 4-99. V., 1999.

SPZ is divided into two strips: strip of strict regime (from accidental pollution) and restriction-sanitary protective strip that has a particular regime determined. Parameters of the strip of strict regime are determined considering local relief, geological-hydrological and sanitary conditions. In all cases the strip of strict regime has to be not smaller than 5 m radius around the drilled well. When there are unfavourable natural (lower relief, unprotected water horizon, etc.) and sanitary conditions, radius of the strip of strict regime around the drilled well can be extended up to 30 m when condensable water horizon is explored and up to 50 m when ground water horizon is explored.

#### 8.7

**Territory of the strip of strict regime has to be fenced (in exceptional cases it may stay without fence if owner of the drilled well ensures safety of the strip and pump of the well), planted, kept clean and protected. In the strip of strict regime it is prohibited to store oil products, chemical and organic materials, use pesticides, perform intensive agriculture, build objects that are not related to water supply, etc.<sup>9</sup>**

Parameters (dimensions and form) of the restriction-sanitary protective strip depend on local relief, existing pollution sites and hydrogeological conditions and they are determined approximately when the place of well is chosen (the strip is different in every case). It is recommended to discuss selection of place for dug well with an engineer hydrogeologist, and installation and maintenance of the well in farmstead with executive of local hygiene centre.

#### 8.8

**Dug well should be established in such a way that surface water or snow would not get into it, animals and any things would not fall into it accidentally. In the same time the well should have a ventilation hole. To protect ground water flowing to the well from pollution, 50 m upstream from the well should not be any farm buildings, field toilets, slurry pits, manure piles, storages of fertiliser, pesticides and oil products as well as greenhouses and intensively fertilised kitchen gardens.**

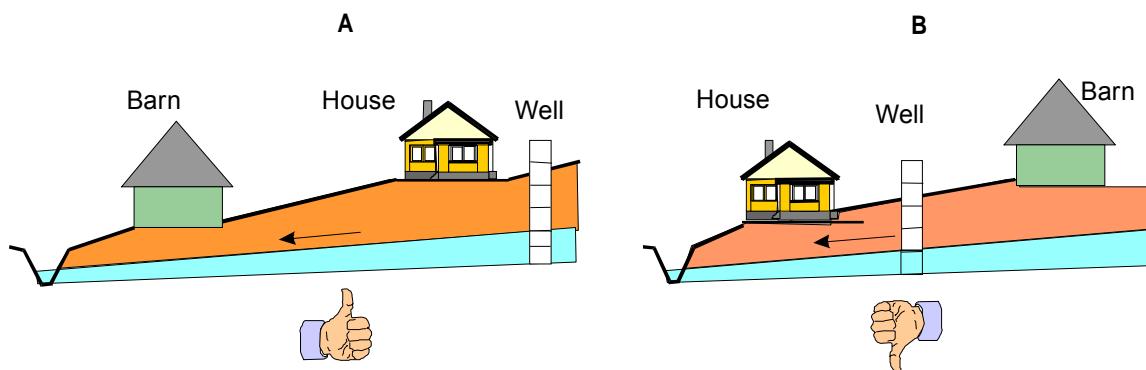


Fig. 8.2. Properly and improperly selected place for well

Dug well may be polluted due to improper manure storage, because liquid manure and water percolating through manure infiltrate deeper, get into the first water-bearing layer that feeds the well. So manure heap located even rather far from the well may pollute it. It is not advisable to build a greenhouse or fertilise kitchen garden intensively close to the well. Management of household wastes also influences purity of water in the wells. If wastes are poured out anywhere, appropriate toilets are not installed, then we can not expect to have pure water in the well.

<sup>9</sup> Order on design, installation, preservation and liquidation of bore wells for water supply and thermal energy use. LAND 4-99. V., 1999.

**8.9**

Consumers, who are not connected to centralised water supply network, provide drinking water themselves and take care about its quality. Concentration of nitrate in drinking water can not exceed 50mg/l.<sup>10</sup> If because of installation of new bore well there could arise wastewater, the installation is allowed only when water consumer guarantees wastewater management.<sup>11</sup>

Artesian wells are rather expensive and less common than drilled wells. But if an artesian well exists inside landowner's land, the well has to be fenced (area of the sanitary protective strip of strict regime). Any economic activity is prohibited in the fenced zone except for mowing of grass.

**8.2. BIOLOGICAL DIVERSITY AND LANDSCAPE**

*Biological diversity is understood as the whole complex of all living organisms species in terrestrial, surface water and other ecosystems, their habitats and also their genetic diversity.*

Biological diversity induces productivity of natural systems, functional diversity of natural environment, maintains its resistance, adaptation and ability to recover. Natural and half-natural terrestrial ecosystems are forests, swamps and meadows, water ecosystems are rivers and lakes, and sea ecosystems – Curonian Lagoon and Baltic Sea. Affected by humans, or anthropogenic ecosystems are agricultural and urban ecosystems. Biological diversity and landscape are unequally vulnerable to human economic activity. The most sensitive places are river valleys, the Lower Nemunas, lake-land in eastern Lithuania and karst region. Distribution of Lithuanian territory according to vulnerability to human economic activity is given in Fig. 8.3.

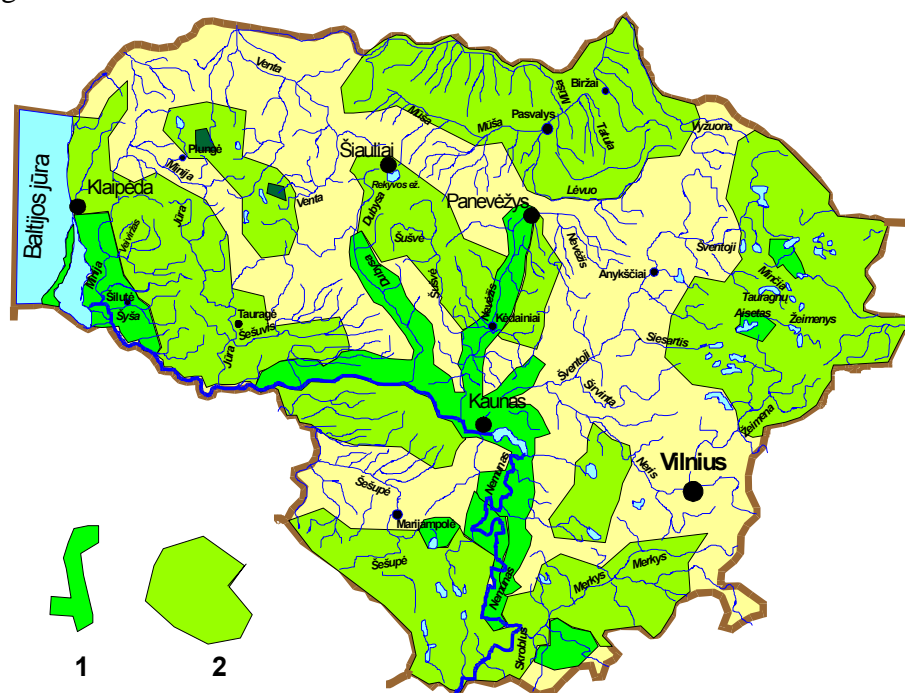


Fig. 8.3. Lithuanian most sensitive (2) and especially sensitive (1) territories where disturbance of biodiversity is expected (according to Lithuanian Environmental Protection Ministry)

<sup>10</sup> Drinking water. Quality requirements and program care. HN 24:1998. V., 1998.

<sup>11</sup> Order on design, installation, preservation and liquidation of bore wells for water supply and thermal energy use. LAND 4-99. V., 1999.

*Biological diversity and landscape are interrelated. The foundation for this is a natural frame – the whole complex of forests, groves and hills' caravans.*

The natural frame is made of upper reaches of the big rivers, groups of lakes, large marshlands, shores of large water bodies, Lithuanian karst region, large river valleys, lakes' caravans and large forest areas.

*Landscape – it is a complex of relief, climate, weather, water, soil flora, fauna and cultural clothing.* It is changing continuously: field is replaced by forest, buildings are built and tore down again, roads are built, marshes drained and rivulets dammed up. There are distinguished natural (not affected by human activity) and anthropogenic (agricultural and urban) landscape.

Biological diversity and natural biological resources are negatively affected by:

- Intensive forest cutting, destroy of groves and bush groups, industrial forestry when few most productive tree species are grown;
- Changes of ecological conditions after draining of large areas;
- Changes of water temperature and migration paths after damming up of rivulets (fish migration paths are cut in this way, temperature water regime changes);
- Increased recreative intensity in nature (people from cities and small towns spend more time in nature);
- Development of road network and intensification of traffic;
- Intensive hunting of wild animals not considering their natural development and lack of continuous control;
- Intensification of agriculture;
- Pollution of air, dusts, water pollution by industrial and agricultural pollutants, pollution of soils of urban environment and physical urban pollution (noise, electromagnetic and thermal pollution).

### 8.3. CONSERVATION OF BIOLOGICAL DIVERSITY AND LANDSCAPE

As agricultural landscape with insertions of natural components comprises more than 70 % of Lithuanian territory, farmers can help a lot in conservation of biological diversity and restoration of traditional landscape.

*The whole complex of living organisms species, their habitats and genetic diversity have to be preserved.*

#### 8.10

**When cultural landscape is being formed, geoecological balance of landscape has to be accomplished, i.e. green areas of natural frame (nuclear) have not to be infringed. It preserves structure of the landscape.<sup>12</sup>**

In agricultural fields there should be grown various crops leaving islands of natural nature. It is advisable to use environmental friendly technologies for soil tillage and to preserve diversity of field edges.

River valleys, the most sensitive places on lake coast are preserved following requirements for water protective zones and eutrophication of waters is reduced in the same time. Trees and bushes of various age have to be conserved in groves, riverside bush-groups and they have to be enlarged preserving Natural Frame.

Agricultural landscape – it is cultivated lands with crop fields, dwelling houses and farmstead buildings and vegetation surrounding them (Fig. 8.4).

<sup>12</sup> Republic of Lithuania. Law on Protected Areas, 1993, V.



*Fig. 8.4. Traditional Lithuanian landscape*

It is recommended to plant more trees of local varieties and bushes in farmsteads (Fig. 8.5).



*Fig. 8.5. Farmsteads surrounded by natural vegetation protect from wind well and form good shelter conditions for wild animals*

It is useful to combine borders of crop rotation fields with existing relief, trees, bush-groups, big stones and historical-cultural heritage.

Landscape in protected territories and natural structure in karst region (Northern Lithuania) have to be conserved with help of reduction of human impact and stimulation of ecological farming.

**8.11  
Meadows, groves, wetlands and ponds should be located in the landscape according to documents of territorial planning.**

Outskirts of drained fields, meadows, pastures and forests, existing stone heaps and hedges have not their numerous flora and fauna – they have to be preserved and augmented.

Single trees with hollows and nests, anthills should be preserved by augmenting and fencing them in.

**8.12**

**It is prohibited to destroy and infringe protected kinds of fauna, fungies and its communities as well as habitats and residence.<sup>13</sup>**

Introduced varieties of trees and bushes should not be expanded in settlements and estates that have cultural residual value. On farm it is recommended to keep local plant varieties giving preference only to varieties that are registered for region and acknowledged.

**8.13**

**Landowners and users are obliged to preserve natural and cultural heritage objects.<sup>14</sup>**

Natural heritage objects are geological (unique pebbles, rocks and sinkholes), hydrogeological (springs with special properties), geomorphological (hills, ravines and gullies), hydrographic (impressive shoals, old riverbeds and waterfalls), botanical and zoological. Cultural heritage objects are archaeological (ancient mounds, defensive fortifications, ancient production sites, sacral mythological stones and places), memorial (closed cemetery), architectural-church, farm and industrial buildings and engineering buildings (bridges, tunnels, irrigation and watering systems and defensive installations). Complex (natural-cultural) landscape objects are also preserved if they have versatile scientific and educational value.

There are enough drained lands in Lithuania; therefore more attention should be paid on maintenance, repair and reconstruction of drainage. Groves, single trees and wetlands have to be preserved. For animal husbandry it is recommended to produce coarse fodder according to traditional technologies giving preference to haymaking. Usage of concentrated fodder should be reduced. It is needed to expand grass plots in eroded lands and in karst region (Northern Lithuania), to spread meadows, groves and wetlands more evenly in landscape and ponds in existing rivulet network.

In order to preserve traditional Lithuanian agricultural landscape, shores of rivulets and ditches and coastal strips have to be set aside, use of pesticides reduced or replaced by natural materials (Fig. 8.6).



*Fig. 8.6. Protective bush strip at Nevėžis riverside*

<sup>13</sup> Republic of Lithuania. Law on Protected Animal, Plant and Fungi Species and Communities, 1997.

<sup>14</sup> Republic of Lithuania. Law on Protected Areas, 1993, V.

## 8.4. SOIL EROSION

*Soil erosion - it is destructive activity of wind or water streams affecting surface soil layer periodically.*

### 8.14

**Physical and juridical persons who use soil resources must:**

- **preserve and enhance soil fertility;**
- **take measures in order to avoid negative effect of soil erosion.<sup>15</sup>**

Rainwater or snow melting waters that flow on soil surface in slope direction cause water erosion. The steeper slope is, the higher speed and energy of the flowing water become. Harm caused by water erosion varies very much: washout of fertile soil layer and nutrients from slopes, destruction of crop fields in eroded slopes, destruction of ditch slopes and roads, blocking of ditch bed with sediments, silting of water bodies and pollution of waters.

The following water erosion types are defined:

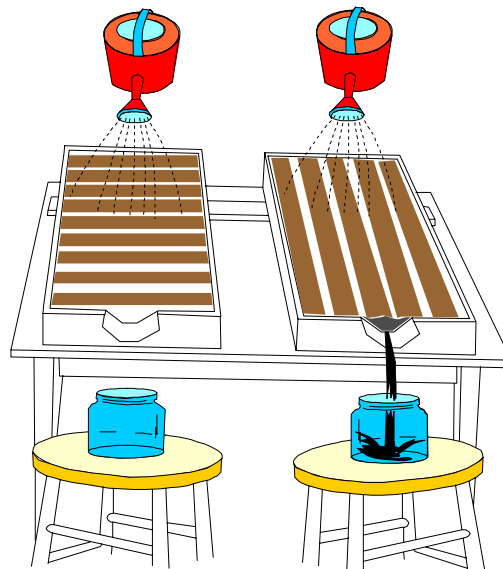
- *Sheet erosion (water flows in wide streams washing out entire soil surface);*
- *Gully erosion (water accumulates and washes out small ditches, channels or ravines).*

#### Sheet erosion

For reducing of sheet erosion it is recommended:

- to apply anti-erosive soil tillage;
- not to leave bare fallow;
- not to plough stubble in autumn;
- to avoid soil tillage with heavy machinery that compacts soils;
- to exploit drainage systems properly;
- to apply anti-erosive crop rotations;
- to apply strip agriculture on slopes of hills.

Anti-erosive soil tillage. *Slopes of hilly lands have to be ploughed across slope turning soil upwards (Fig. 8.7).*



*Fig. 8.7. Slopes of hilly lands have to be ploughed across slope in order to reduce erosion*

Furrows that are formed across slope retain part of precipitation and reduce runoff. Contour ploughing may also be applied, i.e. when ploughing is performed not straight in one direction but exactly along horizontal line, turning soil upwards or downwards of the slope.

<sup>15</sup> Republic of Lithuania. Law on Change of the Law on Land (draft), 1999.

These soil tillage types are more acceptable on rounded and not steep (under 5°) hills. Very effective anti-erosive measure is soil tillage by heavy-duty cultivator (chisel), but it may be applied only in not weedy soils.

Do not leave bare fallow; do not plough stubble in autumn. This measure is applied on fields where cereals grew. It may be used only in not weedy soils.

Avoid soil tillage with heavy machinery that compacts soil. Heavy machinery increases soil compaction and reduces infiltration possibilities. Plant germination and growth conditions become worse. Drainage is damaged. Surface water runoff and soil erosion increase.

Apply anti-erosive crop rotation. Sow winter crop (cover crop) and undercrop; distinctly expressed thalweg (longer than 100 m) sow to perennial grasses.

Apply strip agriculture on slopes of hills. Strip agriculture is a combination of strips of cultivated land with strips of perennial grasses on slopes keeping parallelism to the direction of main horizontal lines. It is recommended to grow alfalfa, fescue and clover. Elements of strip agriculture are recommended on slopes longer than 150 m (Table 8.1).

Table 8.1. Parameters of elements of row agriculture

Slope in degrees	Sandy loam soils		Loam soils	
	Width of grass strip m	Width of arable land strip m	Width of grass strip m	Width of arable land strip m
1-3	7	130	7	60
3-5	15	70	15	30
5-8	15	50	30	30
8-10	29	40	30	20

### Gully (linear) erosion

Hydrotechnical measures are recommended for reduction of linear erosion:

- choose allowed thalweg length according to critical area of thalweg watershed;
- install concrete water gutters;
- install dykes that retain water.

Intensive erosion of thalweg in agricultural area may be reduced by limiting of surface runoff that comes from certain area of watershed and accumulates in thalweg. When accumulated flow exceeds critical value, it has to be removed through drainage pipes. Gully water erosion is dangerous for thalweg that has longitudinal slope of more than 1% and the area of watershed is larger than given in table 8.2.

Table 8.2. Critical area of thalweg watershed (ha) on arable land

Soil mechanical composition	Longitudinal inclination of thalweg in percent				
	2	3	5	7	10
Sandy loam	8.0	5.0	4.0	2.0	1.0
Light loam	9.0	6.0	4.0	3.0	1.5
Medium loam	11.0	8.0	5.0	4.0	3.0
Clay loam and clay	17.0	13.0	10.0	7.0	5.0

Thalweg that has watershed larger than critical value is divided into separate parts so that the area of every part would not exceed the critical value. Accumulated flow from every such part is removed through inlets of drainage. For this purpose the thalweg is divided with a ground partition of 0.20-0.40 m height, and before this dyke there are small pond and inlet arranged for directing of surface water to drains. Slopes of the dyke are flat (ratio between height and length of the slope is 1:3-1:8) and sown to perennial grasses (Fig. 8.8).

Install concrete water gutters. They are used in such places when surface water coming from surrounding areas accumulates and destroys slopes of ditches.

Install dykes that retain water. Such dykes are arranged only if other measures can not stop enlarging of ravines made by gully erosion. They are installed at the upper part of ravine. Their purpose is to retain surface runoff and direct it to branch drains. The height of dykes may be from 0.5 up to 2 m. Coefficients of slopes are 1.5–2.5.

Other hydrotechnical measures can also reduce gully erosion such as ditches that direct water flow, construction of concrete riverbanks, small channels and dykes to disperse water flow, cofferdams, rapids and dams. But every of these measures is applied in certain cases and, besides, it has to be ecologically and economically feasible.

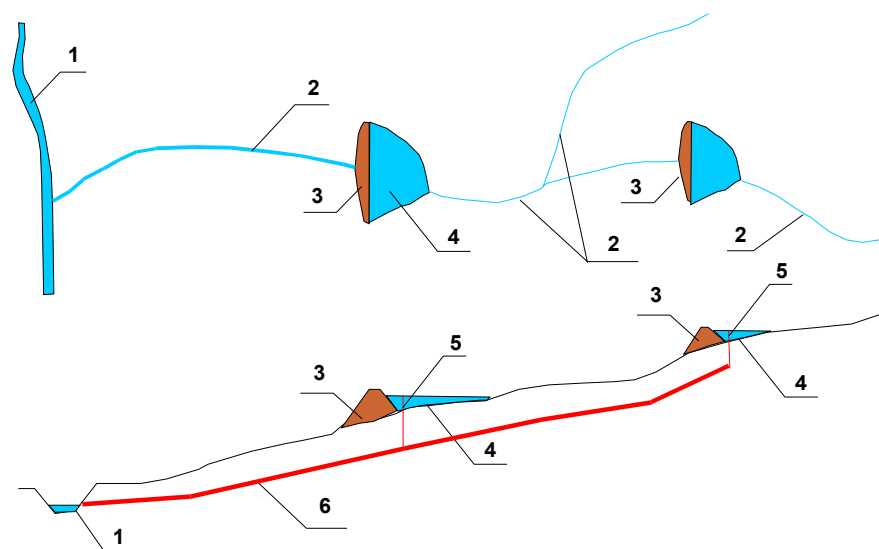


Fig. 8.8. Reduction of surface runoff through installation of dykes and directing of surplus water to drainage: 1 – ditch; 2 – thalweg; 3 – dykes; 4 – small ponds; 5 – inlets for surplus water; 6 - drainage

Wind erosion is not intensive in Lithuania except for Curonian spit, coastal regions and sandy soils of southeastern Lithuania. In middle Lithuania wind erosion is active during snowless winter when soil is frozen and also in early spring when soils become dry quickly. Minimal soil tillage is applied in order to reduce effect of wind erosion. In autumn soil is not cultivated and in spring crops are sown after cultivation of surface layer. This measure is not very effective as weeds flourish in soil that was minimally cultivated and herbicides must necessarily be used. Minimal soil tillage is applied only in well-improved soils without weeds.

Other measure is protective vegetation strips (Fig. 8.9.).

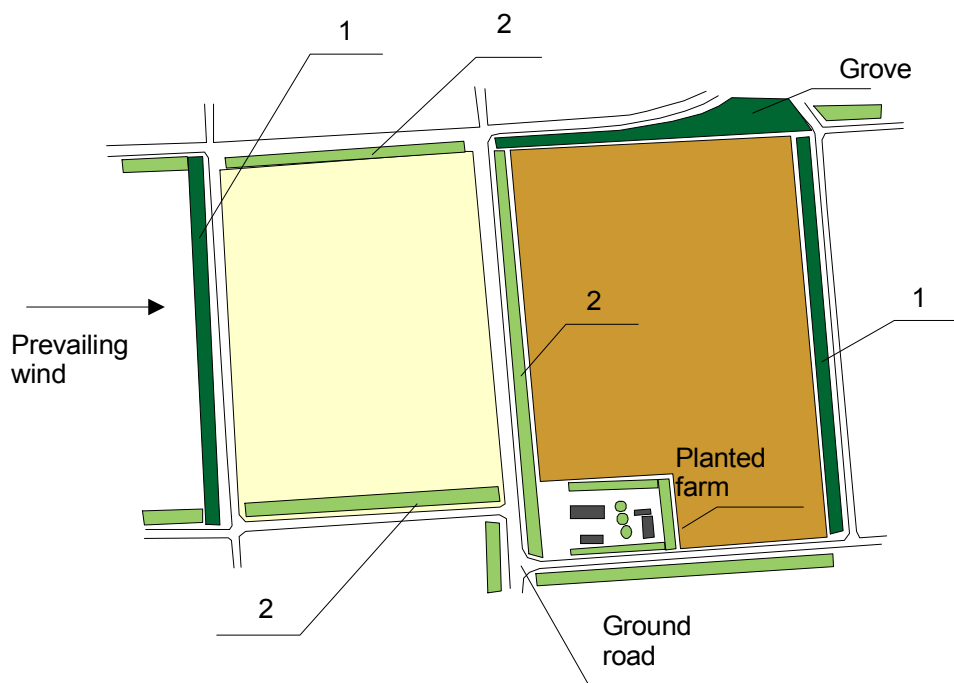


Fig. 8.9. Example of farm planting by vegetation: 1- main strip; 2 – secondary strip

Longer side of protective vegetation strips has to be perpendicular to prevailing winds. Variety composition of plants may be diverse (deciduous and coniferous trees and bushes). Perimeter of protective vegetation strips around agricultural fields has to be at least 1.5-2.0 km per 100 ha of agricultural land. Recommended ration between the length of protective vegetation strip and agricultural land in different regions is the following: 15-40 m/ha in middle Lithuania; 40-60 m/ha in south-eastern Lithuania; 60-100 m/ha in Aukštaičiai and Žemaičiai highlands; 60-80 m/ha in sea-shore plain.

Vegetation has to be planted first on plots that are not suitable for soil cultivation in such places as in confluence of ditches, intersection of ditches and roads, crossroads of field roads and by water bodies. Under conditions of hilly relief the strongly eroded and drifting top of hills and upper hillsides are first planted by vegetation.

## 8.5. WETLANDS

*Wetlands – these are areas that are flooded with water continually or periodically and that have specific hydrological conditions, aquatic vegetation and soil. Wetlands are ‘biological filters’ separating water bodies from adjacent areas. Water self-purifies while it goes through such ‘filter’: pollutants sediment on thick grass vegetation and they do not reach open water bodies.*

Such areas are usually formed in flooded or springy territories of uneven relief. In order to increase biological diversity these areas could occupy from 10 to 15 % of agricultural area.

### 8.15

**In flooded and springy areas it is forbidden:**

- to drain, plough (except for polders) and change otherwise state of flood meadows and pastures and their grass composition;
- to destroy vegetative cover of natural marshes mechanically;
- to change hydrological regime of springs that do not dry up and their groups;

- to drain and make agricultural lands or waters out of upland moors, intermediate marshes and low-lying marshes that have area of more than 0.5 ha and depth of peat more than 1 m.<sup>16</sup>

In order to preserve wetlands it is recommended:

- not to drain areas that are close to water bodies;
- not to drain small swamps formed in zones without flow or zones of divide thalweg (such places should be more diversified with combination of trees and bushes);
- to avoid draining of hollows and springy places not far from water bodies;
- to arrange sedimentation tanks for retention of pollutants and eroded particles in already existing drainage ditches.

Sedimentation tank – it is a deepened and widened section of ditch (Fig. 8.10). It can be arranged at every place of a ditch. There water forms small pond, which becomes overgrown with aquatic vegetation and retains suspended matter and fertiliser coming from fields. Such pond suits for watering of animals and its water may be taken for watering of fields too.

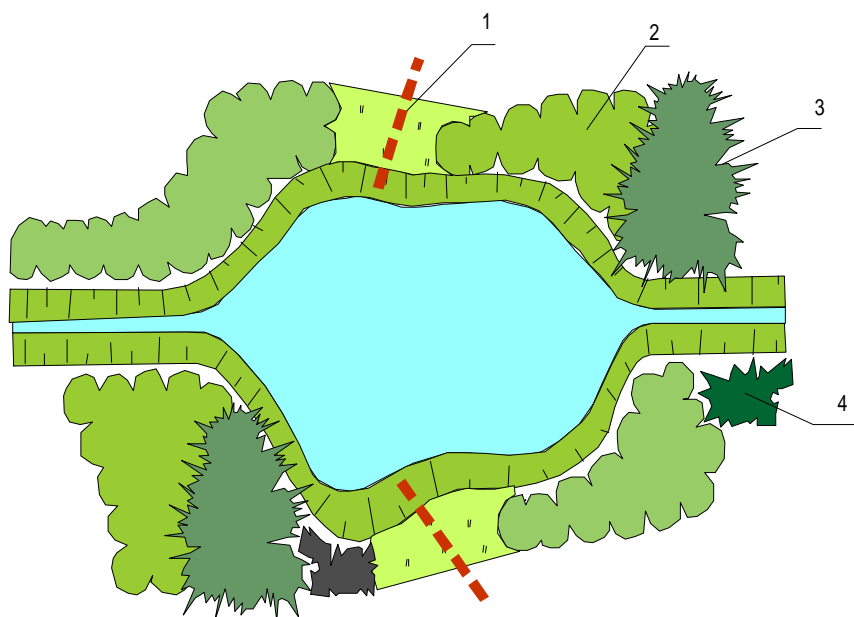


Fig. 8.10. Pond for retention of suspended matter and fertiliser that come from fields: 1- drainage collector; 2,3,4- groups of bushes and various trees

<sup>16</sup> Special conditions on forest and land use. LRG 1992.05.12, Resolution No. 343. V.

