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GLOSSARY OF TERMS RELATING TO RIVER VALLEY PROJECTS

PART XIV SOIL CONSERVATION AND RECLAMATION

Section 1 Soil Conservation

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PART XIV SOIL CONSERVATION AND RECLAMATION

Section 1 Soil Conservation

0. FOREWORD

0.1 This Indian Standard (Part XIV/Sec 1) was adopted by the Indian Standards Institution on 31 March 1977, after the draft finalized by the Terminology Relating to River Valley Projects Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 A number of Indian Standards has already been printed covering various aspects of river valley projects and a large number of standards are in the process of formulation. These standards include technical terms, the precise definitions of which are required to avoid ambiguity in their interpretation. To achieve this end, the Institution is bringing out this glossary of terms relating to river valley projects (IS : 4410) which is being published in parts. The other parts of this standard so far published are given on page 20.

0.3 Part XIV covers the important field of soil conservation and reclamation and in view of the vastness of this subject, it is proposed to cover the subject in three sections. While this section covers terms relating to soil conservation, Section 2 covers terms relating to reclamation.

0.4 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by deriving assistance from the following publications:

United Nations. Economic Commission for Asia and the Far East. Glossary of hydrologic terms used in Asia and Far East. 1956, Bangkok.

India. International Commission on Irrigation and Drainage. Multilingual technical dictionary on irrigation and drainage. 1967.

India. Central Board of Irrigation and Power. Glossary of irrigation and hydro-electric terms and standard notations used in India. 1954. Manager of Publications, Delhi.

Nomenclature for hydraulics. 1962.
American Society of Civil Engineers. New York.

0.4.1 All the definitions taken from 'Multilingual technical dictionary on irrigation and drainage' are marked with asterisk (*) in the standard.

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1. SCOPE

1.1 This standard (Part XIV/Sec 1) covers the definitions of terms relating to soil conservation.

NOTE — Throughout this standard, the terms 'bund' and 'embankment' are used synonymously.

2. GENERAL TERMS

2.1 Afforestation* — Planting of forest cover over denuded land which has no forest or other cover or protection.

2.2 Badlands* — Minutely dissected topography developed by rill wash on a series of weak sedimentary rock or deposits of unconsolidated sands, clays, and gravels usually presenting marked differences in the resistance of successive layers.

2.3 Conservation Farming — The most efficient use of the land over a long period of time which protects and preserves the land for agriculture, forestry, pasture, etc, for sustained production.

2.4 Deforestation* — Act of removal of forest cover from land.

2.5 Edaphology* — The scientific study of the relationship between soils and living entities, including man's use of the land.

2.6 Exhaustive Farming — Farming practices which exhaust the soil over a short period of time.

2.7 Land Forms — Physical features of the land surface developed by the processes of denudation, erosion, sedimentation and tectonic changes such as gullys and larger valleys, residual upland divides, glacial troughs, wave-cut cliffs, wind blow-outs, graben, etc.

2.8 Reforestation* — Renewal of forest cover on denuded land, which has lost protective cover, by natural seeding or artificial planting.

2.9 Scab Lands — Areas where the soil cover is shallow and the rock lies close to the ground surface, is parallel to it, and frequently even exposed. Soils on scab land are so shallow as to be amenable to severe runoff and erosion.

2.10 Soil Conservation — The application to land of cultural, vegetational, structural and management measures, either singly or in combination, needed to develop a system of use and management which will enable the desired level of productivity to be attained without drainage or loss of soil and/or soil fertility on this or other land and without causing any deterioration of the environment.

2.11 Soil Improvement — The result of such practices as are adopted for protecting land against deterioration, rebuilding eroded soil, conserving moisture for crop use, providing proper irrigation and drainage, building up soil fertility and increasing yields which ultimately leads to rationalized land use.

2.12 Soil Management — The practices, such as use of fertilizers, cultivation of plants which maintain or improve the physical, chemical and biological properties of the soil.

3. EROSION

3.1 Abrasion — Mechanical wearing of rock and soil by the action of solid materials moved along by wind, waves, running water, glaciers or gravity.

3.2 Accelerated Erosion — Erosion which has been increased above that which existed under natural environment either as the result of the destruction of vegetative cover or by some activity of man.

3.3 Back Slope — The less sloping side of a ridge.

3.4 Base Level of Erosion* — The lowest level to which a stream can erode its bed.

3.5 Beach Erosion* — The retrogression of the upper line of large lakes and coastal waters caused by wave action, shore currents, or natural causes other than subsidence.

3.6 Blow Out — The depressed area from which soil has been removed by wind erosion.

3.7 Canopy — A cover provided by shrubs/trees to protect the soil from further erosion.

3.8 Cataract Action — The digging back action of a rapid current on a river bed.

3.9 Cattle Terraces — A land configuration resulting from the movement of soil in which the weight of the cattle supplies the energy for detachment and transportation.

3.10 Channel Erosion* — Erosion occurring where surface water has concentrated so that a large mass of water supplies the energy both for detaching and transporting the soil. Channel erosion exists as 'stream erosion' (*see* **3.64**), 'rill erosion' (*see* **3.52**) and 'gully erosion' (*see* **3.32**).

3.11 Colluvium — Loose incoherent deposit at the foot of a slope of cliff, brought there principally by gravity but not carried away.

3.12 Contemporaneous Erosion — Erosion of a local or unimportant character that takes place while sedimentation is taking place elsewhere.

3.13 Continuous Trenching — An arrangement of trenches along the soil embankment in a continuous manner generally across a slope, used as a type of soil conservation measure for steeply sloping lands.

3.14 Corrasion — The mechanical process involved in the wearing away of rock and soil by scouring action of rock fragments activated by wind or water.

3.15 Corrosion* — The gradual deterioration or destruction of a substance or material by chemical action, frequently induced by electro-chemical processes.

3.16 Culturally-Induced Erosion — Erosion caused by increased runoff or wind action due to the work of man in deforestation by cutting or burning protective cover cultivation of the land, overgrazing, and disturbances of the natural drainage; the excess of erosion by the acts of man over that normal for the area.

3.17 Debris Avalanche* — The sudden movement of soil downslope of the soil mantle on steep slopes caused by its complete saturation through protracted heavy rains.

3.18 Deflation — The complete removal of loose material by wind, exposing the underlying rock.

3.19 Denudation*

a) The erosion by rain, frost, wind, running water, and other agencies, of the solid matter of the earth so that strata formerly covered are exposed, and elevations are worn down.

b) The removal, either by natural or artificial means, of all vegetative and organic matter so that the land surface is bare.

3.20 Deposition

a) The process of subsidence of solid material held in suspension in water.

b) The geological process involving the accumulation of rock material or other debris transported by such agencies as flowing water, waves, winds, glaciers, etc; also the mass movement of the material itself, resulting from subsidence due to the slackening movement of the transporting agency.

3.21 Desert Erosion* — That form of erosion or general wearing away of rocks which takes place in arid countries, such erosion being due largely to the wind. Arid erosion is equivalent to 'desert erosion', and is in contradiction to normal, glacial and marine erosion.

3.22 Detachment* — The removal from a soil mass of transportable fragments of soil material by an eroding agent, usually falling rain-drops, running water or wind.

3.23 Earth Flow — A slow flow of earth lubricated with water occurring as either a low angle terrace flow or a somewhat steeper but slow hill-side flow.

3.24 Elutriation, Assortment, or Selective Erosion* — A process by which runoff from soil, particularly sandy land, picks up and carries away the finer, lighter particles leaving behind the larger, heavier particles.

3.25 Eolian* — Of or relating to, formed by, or deposited from the wind or currents of air.

3.26 Erodibility — The relative ease with which the soil is eroded.

3.27 Erodible — A soil, that is easily eroded or susceptible to erosion.

3.28 Erosion — The detachment and movement of soil particles by precipitation, surface, runoff, stream flow, sediment moved along by water waves and glaciers, wind, etc.

3.29 Escarpment* — A more or less continuous line of cliffs or the steep slopes facing in one general direction which are caused by erosion or faulting.

3.30 Fluvial Erosion* — Erosion caused by the action of running water.

3.31 Gully — A small, elongated depression, usually eroded, in the land surface, usually dry except after a rainstorm; a channel or miniature valley cut by running water, but through which water commonly flows only during and immediately after heavy rains or during the melting of snow. The distinction between, gully, and rill is one of size (*see also* **3.49**). A gully is sufficiently deep that it would not be obliterated by normal tillage operations whereas rill is of lesser depth and would be smoothed by ordinary farm tillage.

3.32 Gully Erosion — Removal of soil by excessive concentration of running water in gullies resulting in the formation of deep channels which cannot be obliterated by tillage.

3.33 Headwater Erosion* — Erosion which occurs in the upstream end of the valley of a stream, causing it to lengthen its course in such direction.

3.34 Incipient Erosion — The early stages of erosion, especially with reference to gully erosion.

3.35 Landslide — The rapid, massive moment of earth or rock, or a mixture of both, in downward and outward directions.

3.36 Lateral Erosion — The scouring of material from the sides and bed of water channel and the cutting of the banks by running water.

3.37 Leaching

a) 1) Removal of materials in solution.
   2) Solution of minerals and organic matter followed by percolation of the dissolved substances.

b) 1) The removal of soluble constituents from soils or other material by percolating liquid.
   2) The removal of salts and alkali from soil matrix by abundant irrigation combined with drainage.
   3) The disposal of a liquid through a non-watertight artificial structure, conduit, or porous material by downward or lateral drainage, or both, into the surrounding permeable soils.

3.38 Mass Movement — A slow or rapid movement involving large masses (*see* **3.35**, **3.41**, **3.59** and **3.62**).

3.39 Minimal Impact Threshold Wind Velocity — The minimum wind velocity to start erosion or to initiate erosion in an area when saltation particles from neighbouring area are falling on the area and adding their kinetic energy to that of the wind to start the soil moving.

3.40 Minimal Threshold Wind Velocity — Wind velocity required to start erosion in an area without assistance of outside particles.

3.41 Mudflow* — The flow of heterogeneous debris lubricated with a large amount of water usually following a former stream course.

3.42 Non-erodible — Soil which is resistant to erosion.

3.43 Pavement Erosion* — The accumulation of fragments of rock or coarse particles at the surface of a soil, caused primarily by the removal of the fine material by surface rainwash, wind or erosion.

3.44 Peneplain* — A relatively flat, featureless plain which has resulted from the erosion of former overlying formations first, by streams cutting a series of channels, and then the ridges which lay between such channels eroding until the resulting surface is almost flat.

3.45 Pluvial Denudation — Denudation effected by rain.

3.46 Raindrop Erosion or Splash Erosion* — A form of soil erosion resulting from soil splash caused by the impact of falling rain drops.

3.47 Rain Pillars* — Minor erosional forms composed of upward projecting pillars of soil or soft rock capped and protected by pebbles or concretions.

3.48 Rain Wash — The detachment and transportion of soil material under the impact of rain.

3.49 Ravine — A gorge or deep gully with steep sides caused by erosive action of flowing water.

3.50 Rejuvenation

a) The renewal of erosive activity relating to streams.

b) The development of youthful features of topography in an area previously worn down to a base level.

3.51 Rill — A very small passage caused by surface runoff a few centimetres in depth with steep sides but usually presenting no obstacle to agricultural machinery.

3.52 Rill Erosion — The type of erosion which occurs when runoff water concentrates in rills in sufficient volume and velocity to generate cutting power.

3.53 Saltation

a) Wind erosion by short jumps from unprotected surface.

b) Discontinuous motion of particles in the fluid above the bed of a channel in series of short hops.

3.54 Sand Dune — A sand wave of approximately triangular cross section in a vertical plane in the direction of flow formed by moving wind or downstream water with gently upstream slope and steep downstream slope which travels downstream by the movement of sediment up the upstream slope and the deposition of it on the downstream slope.

3.55 Sheet Erosion, or Sheet Washings* — The type of erosion which occurs when material is removed from the surface in a thin layer or sheet of relatively uniform thickness, generally resulting from sudden heavy rainfall.

3.56 Shore Erosion* — Removal of sand, soil, or rock from the shore land area adjacent to oceans, seas, lakes, or ponds due to the action of water, wave or wind.

3.57 Slip-Off Slope Bank — Slip is a phenomenon that occurs in unstable soil bank flow. The 'slip surface' or the 'surface of rupture' or the 'surface of failure' occurs across the points of maximum shear stress and by definition lies at an angle of $45° + \phi$ (where ϕ is the angle of friction or angle of shearing resistance) to the plane upon which major principal stress acts.

3.58 Sloughing — Sliding of overlying material where the bank or an underlying stratum is saturated.

3.59 Slump — The downward slipping of a mass of rock or soil moving as a unit or as several subsidiary units, usually with backward rotation on a more or less horizontal axis parallel to the cliff or slope from which it descends.

3.60 Soil Creep — The slow movement, usually over relatively short distances of a mass of soil, acting under the force of gravity. The term is usually applied to such a phenomenon when it is much slower and smaller in magnitude and extent than a landslide.

3.61 Soil Erosion* — The process of detachment and movement of soil from the land surface by wind or running water, including normal soil erosion and accelerated erosion.

3.62 Solifluxion — *See* **3.60**.

3.63 Stream-Bank Erosion — The scouring of material from the sides and bed of water channel and the cutting of the banks by running water.

3.64 Stream Erosion — *See* **3.63**.

3.65 Subsidence* — The lowering of the elevation of surface soil due to disappearance or shrinkage of the material below.

3.66 Surface Creep* — Movement of soil particles by wind along surface of ground, rolling, but not jumping or flying.

3.67 Surface Erosion* — The erosion of exposed soil or exposed rock surfaces by disintegrating, dissolving and wearing action of water, ice, wind and other atmospheric agencies.

3.68 Surface Sealing of Soil* — The packing of dispersed soil particles in the immediate surface layer whereby it becomes almost impermeable to water and air.

3.69 Suspension — Very fine dust particles entrained in the air stream suspended by the turbulence of the wind.

3.70 Terracettes — A small steplike form developed on the surface of a slumped soil mass along a steep grassy incline.

3.71 Toe Slope — The lower portion of the back slope.

3.72 Transportation* — The movement of detached soil material across the land surface or through the air by running water, wind or gravity.

3.73 Undercut-Slope Bank — The bank of a meandering stream eroded by stream action.

3.74 Water Erosion — The removal of soil from the exposed surface of land by rapidly running water, including runoff from rainfall, melted snow and ice.

3.75 Weathering* — The geological processes caused by physical and chemical action by atmospheric agencies upon rocks at or near the surface of the lithosphere, which result in the disintegration and decomposition of such rock and in some instances its removal to other locations by separate wind and water action.

3.76 Wind Erosion* — The detachment, transportation, and deposition of soil by the action of wind. The removal and deposition may be more or less in uniform layers or as localized blowouts and sand dunes.

4. SOIL CONSERVATION

4.1 Absorptive Outlet* — Outlet channel in which contour furrows, ridges, ditches, or other such means are used to collect and hold runoff until it is absorbed by the soil.

4.2 Absorptive Terrace or Retention Terrace — A terrace of variable cross section constructed by excavating on both sides of the bund (ridge), formed and designed primarily for the retention and spreading of moisture over the widest possible area.

4.3 Bench Terrace — A terrace in the form of bench or strip designed to facilitate soil conservation erosion control, and cropping on steep slopes by the development of level or flat gradient strips normal to the slope used for agricultural purposes.

4.4 Box Inlet Drop Spillway* — A rectangular box open both at the top and at the downstream end; and outlet structure is attached to the open end of the box inlet.

4.5 Broad Base Terrace — A low embankment or ridge with gently sloping sides, rounded crown, and a broad shallow channel along the upper side, constructed to control erosion by diverting runoff along the contour at low velocity instead of permitting it to rush down the slope or to intercept and retain runoff on the terraced land. It may be level or have a grade toward one or both ends.

4.6 Brush Matting* — A matting of branches placed on badly eroded land to conserve moisture and reduce erosion while trees or other vegetative covers are being established.

4.7 Buffer Strip* — A more or less permanent contour strip, usually of variable width, planted with grass or other erosion-resistant vegetation which is not a part of the regular farm rotation, and which may or may not be harvested.

4.8 Channel Improvement* — The improvement of the hydraulic flow characteristics of a natural or artificial channel by clearing, excavation or other means in order to increase its carrying capacity and prevent channel erosion.

4.9 Check Dam or Check — A small low fixed dam, constructed of brush, logs, timber, loose rock, masonry or concrete in an eroded channel to reduce the slope of the water flowing therein during high stages, and also the resulting velocity thereby preventing excessive scour and erosion and inducing deposition. Such dams are also used to retain debris. They are usually built of inexpensive and temporary materials where dependence for ultimate protection is placed on vegetative cover.

4.10 Chute*

a) An inclined drop or fall in which the lowering of the water surface achieved over a relatively long length of the channel but where the slope is steep enough to develop high velocities. It has generally a higher drop than in falls.

b) High velocity conduit for conveying water to lower level, an inclined drop or fall.

4.11 Clean Tilled Crops* — Crops which are planted in rows far enough apart for intertillage.

4.12 Collective Outlet* — A draw or channel that receives the discharges from two or more terraces.

4.13 Contour Bund — A small bund (embankment) constructed along a contour.

4.14 Contour Bunding/Level Narrow-Base Terracing — The construction of a series of contour bunds so as to provide barriers to the flow of water along a slope.

4.15 Contour Cultivation, Contour Farming* — The process of conducting field operations, such as ploughing, planting and cultivation on the contour or at right angles to the natural direction of slope.

4.16 Contour Strip Cropping* — The farming of sloping land in alternate strips of intertilled row crops and close-growing crops. These strips are placed on the contours at right angles to the direction of the natural flow of surface runoff water with the purpose of slowing down the runoff and of filtering out in the close-growing crop the soil washed from the land in the intertilled crop.

4.17 Crop Residues* — A term used to designate leftovers from crops.

4.18 Crop Rotation* — The growing of a selected number of different kinds of crops in regular order on any particular field.

4.19 Diversion Terrace — A terrace constructed to divert water from a terrace system, or to divert water from its natural drainage channel for some purpose.

4.20 Drainage Terrace, Drainage Control Terrace, Interception and Diversion Terrace, Runoff Control Terrace, or Channel Terrace* — A graded terrace built with a relatively deep channel designed primarily for the systematic interception and discharge of surface runoff at non-corrosive velocities.

4.21 Dug Out Ponds — Micro-storages developed by deepening natural depressions or ground surface.

4.22 Erosion Control — The application of necessary measures to control accelerated erosion of land surfaces by vegetative or by artificial structures, such as terraces, dams, retards, baffles, etc; in contrast to vegetative control.

4.23 Exhaustive Farming — Farming practices which exhaust the soil over a short period of time.

4.24 Field Strip Cropping* — The farming or relatively narrow strips of uniform width across the general slope but not closely following the contours.

4.25 Flat Land — Land with a slope of less than 1 percent and at times having trough like topographic condition with inadequate drainage.

4.26 Furrowing — A kind of tillage practice involving formation of ridges and furrows to conserve moisture in dry land agriculture or aid in the application of water to row crops in irrigated agriculture.

4.27 Gently Sloping Land — Land with slope gradient ranging from 3 to 5 percent.

4.28 Grade-Stabilizing Structure* — A dam or drop structure constructed for the purpose of stabilizing the grade of gully of other watercourse, thereby preventing further head cutting or lowering of the channel grade.

4.29 Graded Bench Terrace — A level terrace having a longitudinal gradient across the hill slope, that is along the bench level, and is normally used for raising non-paddy crops such as potato.

4.30 Graded Bund — A small bund (embankment) constructed on a falling or graded contour and provided with a channel on the upstream side.

4.31 Graded Bunding/Narrow Base Terracing — Constructing a series of bunds on falling or graded contours at regular intervals with a channel on the upstream side to break the slope for diverting runoff safely.

4.32 Graded (Channel) Terrace — A terrace with a constant or variable grade along its length (as contrasted with level terrace).

4.33 Grassed Chute* — A specially prepared slope, used to control headward erosion of gullies, which safely carries water from natural ground surface to the gully floor. It is level in cross section and is provided with a dense cover of grass to protect its surface from erosion.

4.34 Grassed Waterways or Sod Waterways* — A vegetated waterways used to conduct the accumulated runoff from cultivated fields in a strip-crop or terrace system.

4.35 Grassland Farming* — Arrangement of permanent pasture; use of grasses and similar plants in strips, as permanent soil stabilizers in waterways and headlands, as crops in rotation, as fertilizers or green manures, and as cover crops.

4.36 Ground Cover — A vegetative or other types of cover over the soil for protecting it against erosion.

4.37 Gully Control* — Regulation of erosion of soil in a gully by structural or vegetative means.

4.38 Gully Plugging — A treatment involving the construction of gully control structures, such as check dams for preventing gully erosion particularly at the gully head.

4.39 Head Ditch (Field Irrigation Channel) — The main field channel.

4.40 Header* — A structure installed at the head or upper end of a gully to prevent overall cutting.

4.41 Land Capability Classes — Grouping of lands into classes of similar production potential for agricultures, pasture, forestry, etc, with a view of making the best use of each piece of land without causing excessive erosion, or loss of productivity.

4.42 Lateral Bunds — A series of embankment constructed along a slope at right angles and at intervals along the length of a contour bund in order to prevent runoff accmulation in a depression.

4.43 Level (Contour) Terrace — A terrace that follows a contour along its length [as contrasted with a graded (channel) terrace].

4.44 Level (Paddy) Bench Terrace — A bench terrace having no slope in any direction and generally used to grow paddy.

4.45 Ley Farming — A system of farming in which grass is used in rotation as a practice for soil and moisture conservation.

4.46 Listing or Basin Listing* — The ploughing or furrowing of land, usually in the contour, with a special lister that places earth plugs at intervals in the open furrows to form small basins between them.

4.47 Marginal Bund

a) An embankment which is constructed at the lowest part of the catchment without any reference to contour.

b) An embankment constructed along the river at a short distance from the river banks with the object of preventing inundation of the area behind the embankment.

4.48 Marginal Land — Land at vulnerable locations along the banks of a stream or periphery of a tank or reservoir. It may be degraded/ eroded/water logged.

4.49 Meadow Strip (Pasture Strip) — A relatively flat, shallow swale protected with adaptable grasses or legumes in an area large enough to form an economical pasture or 'hay unit'.

4.50 Mulch* — A natural or artificially applied layer of plant residues or other materials on the surface of the soil. Mulches are generally used to help conserve moisture, control temperature, prevent surface compaction or crusting; reduce runoff and erosion, improve soil structure or control weeds.

4.51 Mulch Tillage or Mulch Farming — A crop and soil management practice that utilizes the preceding crop residue by leaving a percentage of the latter on or near surface of the ground as a protective mulch.

4.52 Narrow-Base Terrace — A terrace similar to a broad-base terrace in all respects excepting the width of ridge and channel.

4.53 Pasture Management* — The establishment and maintenance of a dense ward of vegetation by fertilization, grazing control and cultivation.

4.54 Paving* — A cover of stone or other material used to protect an earth dam face, a dike, or shore from the erosive action of waves and currents.

4.55 Peripheral Bund — An embankment constructed along the periphery of gully heads and banks at a short distance from the head to prevent encroachment of gullies into adjoining land.

4.56 Permanent Strip* — A relatively narrow or small area of land kept in permanent cover for the purpose of retarding runoff and checking erosion by wind or water.

4.57 Pond Management* — Developing suitable measures for protecting ponds, such as production of fish and other wild life, fire protection, and stock water.

4.58 Regenerated Soil* — Soil which was once impoverished by soil erosion but which has been restored to its normal productivity by various ameliorelative measures.

4.59 Retention Dam/Check Dam — A dam, usually small in size, constructed to impound or retard temporarily surface runoff and bring about deposition of a substantial portion of the soil being carried away by storm water runoff.

4.60 Ridge Planting* — Placement of plants on top or sides of ridges of soil.

4.61 Rock Wash — A natural drainage-way that conveys runoff and is adequately protected from erosion by rock or gravel deposits.

4.62 Rolling Topography — Land with slope gradient ranging from 5 to 10 percent.

4.63 Sedimentation — The process of deposition of fragmental material transported by, suspended in or deposited by a flowing channel without any regard to size. Sediments in rivers and canals may be classified in accordance with IS : 1498-1970†.

4.64 Shelter Belt — A natural or plant barrier of trees or shrubs to control wind erosion by providing barriers against wind movement and also minimize the drying effect of wind on soil.

4.65 Shifting (Jhum) Cultivation — Cultivation for one or two crops along slopes in hilly areas after deforestation and burning vegetation, without terracing or bunding leading to denudation of forest cover and top soil. The frequency in years at which Jhum cultivation is done in the same area is known as the ' Jhum cycle '.

4.66 Side Bund — An embankment constructed along the slope usually at right angle to the contour bund.

4.67 Sloping Bench Terrace — A bench terrace with a cross slope. A bench with a cross slope away from the hill side is said to be an outwardly sloping bench terrace and that with a cross slope towards the hill side is called an inwardly sloping bench terrace.

4.68 Sod — A surface layer of soil matted or held together by roots, rhizomes and stolons of grasses and other herbs.

†Classification and identification of soils for general engineering purposes *(first revision)*.

4.69 Sodding* — Laying grass-covered earth on side slopes of drainage ditches to prevent erosion.

4.70 Soil Binder (Vegetative) — A plant used to prevent soil erosion, as various grasses or stoloniferous plants.

4.71 Soil Saving Dam — A dam, usually small in size, constructed to impound or retard temporarily surface runoff and bring about deposition of a substantial portion of the soil being carried away by storm water runoff.

4.72 Soil Saving Dike — An earth dike constructed at the lower end of an irrigated field, for the purpose of holding soil sediment.

4.73 Solid Sodding — Transplanting of a continuous layer of sod over an area.

4.74 Spot Sodding — Transplanting of springs of grass roots or root stocks more or less at random.

4.75 Spur Terrace — A short terrace used to collect and/or divert runoff.

4.76 Staggered Trenching — A type of soil conservation measure with staggered trenches.

4.77 Strip Cropping — The practice of growing crops by a systematic arrangement of strips or bands. Erosion permitting crops (row or grain crops) and erosin resisting crops (cover crops or sod) are alternated in strips to protect the soil and vegetation against running water or wind. The alternate strips are laid out approximately along the contour on erosive soils or at approximate right angles to the prevailing direction of the wind where soil blowing is a hazard.

4.78 Strip Sodding* — Laying sods in strips approximately on the contour and at regular intervals down the slope.

4.79 Stubble Mulching (Mulch Tillage or Mulch Farming) — A crop and soil management practice that utilizes the residual mulches of the preceding crop by leaving a percentage of this vegetal residue on or near surface of the ground as a protective mulch.

4.80 Subsoiling — A process of mechanically loosening or fracturing the subsoil to increase infiltration, penetrability to plant roots and aeration.

4.81 Table Land — A broad elevated, nearly level land or deeply cut at intervals or by valleys due to sheet and rill erosion or broken by escarpments.

4.82 Terrace

a) A flat, level or nearly level, narrow, area of land bordering a river, bounded on at least one side by a definite steep slope rising upward from it. (Generally termed a 'river terrace'.)

b) A low embankment or ridge of earth constructed across a slope to control surface runoff and minimize soil erosion by intensive runoff.

c) Sloping ground cut into a succession of benches and steep inclines for purposes of cultivation. Often inclines are made quite steep and are protected by riprap, or retaining walls are substituted, thus giving greater areas for cultivation.

d) Areas bordered by low broad ridges constructed on cultivated land of such alignment, height and spacing as to conform to the topography and to permit travel of cultivating and/or harvesting machinery, the object being to prevent loss of soil by erosion.

4.83 Terracing — A method of erosion control and moisture conservation by constructing a series of mechanical barriers or benches across the land slope, with arrangements for disposal of excess runoff in order to break the length of slope and also to reduce the degree of slope.

4.84 Terrace Crown — The highest part of the terrace ridge, that is the top of a terrace.

4.85 Terrace Outlet Channel, Outlet Channel, or Outlet* — A water way or drainage channel provided to collect and carry away the runoff discharged from terrace channels.

4.86 Terrace Spacing — The distance between the two corresponding points on two successive terraces. The elevation difference may be expressed as vertical interval (V I) and horizontal distance as horizontal interval (H I).

4.87 Terrace System* — A complete series of terraces occupying a slope and either discharging runoff into an outlet channel or intercepting runoff and retaining it on the terraced land.

4.88 Tillage* — The mechanical manipulation of the soil to provide soil conditions suited to the growth of crops, the control of weeds, and for the maintenance of infiltration capacity and aeration.

4.89 Tilth* — The physical condition of a soil in respect to its fitness for the growth of a specified plant or sequence of plants.

4.90 Trenching — A type of terracing where small trenches are constructed across the land slope in order to intercept and either to drain it safely or to conserve it on land, particularly for improving soil condition of the degraded land slopes where afforestation of pasture development programmes are taken. When the trenches are made on contour, it is

called contour trenching and when the trenches are provided with a gradient across land slope, it is called graded trenching.

4.91 Under-Cut Slope Bank — The bank of a meandering stream eroded by stream action.

4.92 Vegetated Outlet* — Any channel, depression, or area stabilized with vegetation sufficiently to permit safe disposal of terrace discharge.

4.93 Water Control — The physical control of water by such measures as conservation practices on land, as channel improvement and installation of structures for water retardation and sediment detention.

4.94 Watershed Management* — The planned use of watershed lands in accordance with predetermined objectives, such as the control of erosion, streamflow, sedimentation, and the improvement of vegetative cover and other related resources.

4.95 Wind-Break — Any object which serves as an obstacle to free movement of surface winds. In forestry, trees serve such a purpose. Tree wind-breaks are classified according to their general arrangement as rows and hedge-rows, belts and shelter belts of three or more rows and groves.

4.96 Wind Strip Cropping* — Planting of regular farm crops in straight parallel strips at right angles to the direction of the prevailing winds, without regard to the contour.

4.97 Wire Dam, or Wire-Wrapped Dam* — A dam constructed of rock held together by wire mesh, used principally in flood protection works.

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones: 331 01 31, 331 13 75 Telegrams: Manaksanstha
(Common to all Offices)

Regional Offices:	*Telephone*
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*Sales Office in Calcutta is at 5 Chowringhee Approach, P. O. Princep Street, Calcutta 700072 — 27 68 00

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