Chapter 19

RAINGAUGES, RAINFALL AND SNOWFALL

Introduction

19.1. The water is a main input for better growth and promising yield of agricultural crops, which is provided in the shape of irrigation through artificial means or through rains occurring naturally. The scope of creation of irrigation potential in the State is limited and as such a major portion of area sown under crops is depending upon rainfed conditions. For studying the trend of rains during each crop season, it is essential to establish a reliable system of rainfall recording. In the State, the registration of rainfall is under the control of Director of Land Records. Presently, the daily rainfall data is being recorded by Office Kanungos of Revenue Department in respect of 36 rainguages installed at Tehsil Headquarters of the State, 37 other rainguages have been installed by Departments, like Public Works, Health and Forest in the State. These Departments send information of rainfall to the respective Deputy Commissioners after every month. It has been generally observed that the rainfall data is not being submitted by these Departments in time. The respective Departments shall submit the rainfall returns to the concerned Deputy Commissioners by 5th of each month positively. These Departments shall maintain the raingauges in proper condition.

The Revenue Department shall endeavour to install raingauges at every Tehsil Headquarter in a phased manner where these raingauges have not been installed so far.

The rainfall organization

19.2. The registration of the rainfall of the Himachal Pradesh is under the control of the Director of Land Records. The duties of controlling officer, as specified in the Meteorological Department circular on rainfall, are:-

(a) The suitable distribution of raingauge stations so that the rainfall of the state is properly represented.

(b) The choice of suitable sites for the gauges.

(c) The issue of raingauges and measuring glasses by countersigning indents on the Deputy Director General of Meteorology (Instruments, Inspections and Servicing), Pune-5, which will not, as a rule, supply a rain-gauge unless the indent is countersigned by the Controlling Officer.

(d) The collection of data.

(e) The preparation of rainfall statement for publication in the official Gazette.

In cases of doubt as to the desirability of starting new gauges and changing the sites of old ones, the Director-General of Observatories should be consulted. In the latter case a site plan showing the distance and bearing of the new site with respect to the old one should be sent.

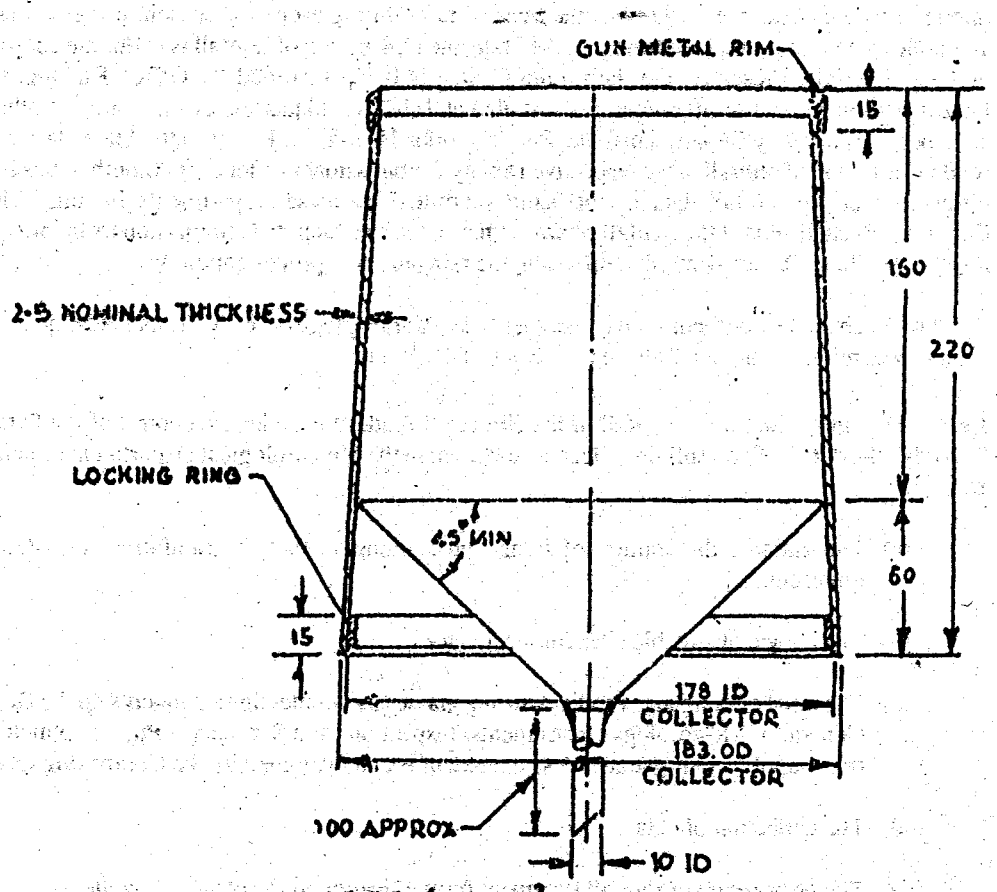
Under whose charge placed.

19.3. Rain-gauges at the headquarters of a district should be placed in charge of the Statistical Assistant, or other clerk, as may be convenient in each case. Those at tehsils should be incharge of the Tehsil Office Kanungo.

Pattern of Raingauge.

19.4. Except at canal stations, in respect of which the Irrigation Department issues its own instructions the rain-gauges in use are of Non-recording Fibreglass.

REINFORCED POLYSTER (FRP) PATTERN

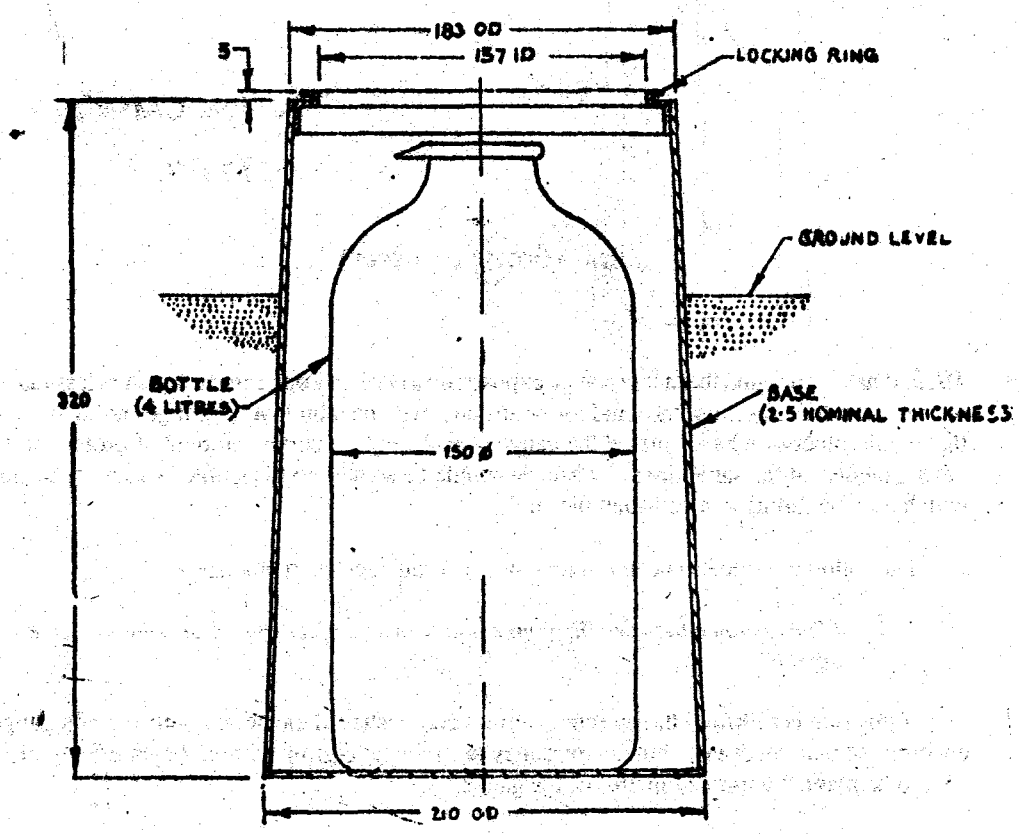


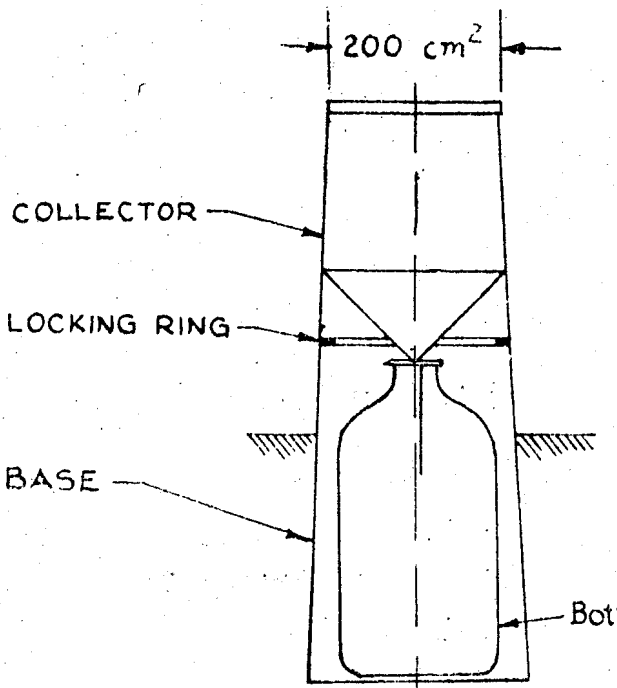
LARGE (200 cm^2 COLLECTING AREA)

ALL DIMENSIONS IN mm

This pattern of gauge is shown in Figure 1, and is called "Rain-gauage", 200 mm rainfall is: 5225.

The gauge is built of three parts, (a) Collector, (b) the base, and (c) the bottle. These are shown in figure 2.





DIMENSIONS FOR BASE AND BOTTLE

200 mm. CAPACITY

FIG. 2.

Locality of rain-gauge

19.5. It has been found that a rain-gauge exposed on a perfectly open space registers less than the true amount of rain. This arises because the wind forms an eddy over the mouth of the gauge and carries away small drops that would otherwise have entered the gauge. Accordingly, a certain amount of protection from the wind is advantageous: at the same time no obstacle should be so near to the gauge as actually to shield it from rain which may be falling at a considerable angle.

The following rule has been found to be most satisfactory in practice:-

> *"The distance between the gauge and nearest object should be at least twice the height of that object."*

If this rule is followed the presence of trees and bushes in the neighbourhood of a gauge is rather to be encouraged than otherwise: but (as trees may be allowed to grow without being effectively lopped) no tree should be planted within 27 metres of the gauge.

The gauge should never be situated on the side or top of a hill if a suitable site on level ground can be found. In the hills, where it is difficult to find a level space, the site for the gauge should be chosen where it is best shielded from high winds, and where the wind does not cause eddies.

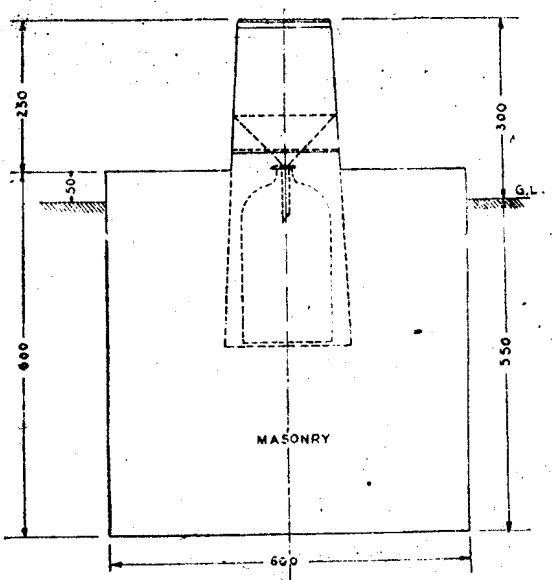
*Only under very exceptional circumstances should a gauge be exposed on a roof.

If it is impossible to choose a site in conformity with the above stipulations a detailed report should be made to the controlling officer, and his sanction obtained to erecting the gauge in the abnormal site proposed.

It is not intended that all the gauges now on roofs should be at once removed to ground sites. Opportunities should, however, be taken as they arise for effecting a change for example, when an office is removed form one building to another, or when a site on a roof becomes unsuitable.

Erection of the gauge.

19.6. A masonry or concrete foundation for the gauge should be provided, the best form being a cube of 600 mm sides sunk into the ground so that its top is just 50 mm. above the general level of the ground. Into this foundation the base of the gauge (a, figure 2) is firmly cemented, so that the top of the complete gauge is exactly 300 mm. above the ground level (see figure 3). Great care must be taken when setting the gauge to ensure that the mouth is perfectly level. The horizontality should be checked with a Spirit level laid across the rim.



INSTALLATION OF RAINGAUGE

Protection of gauge

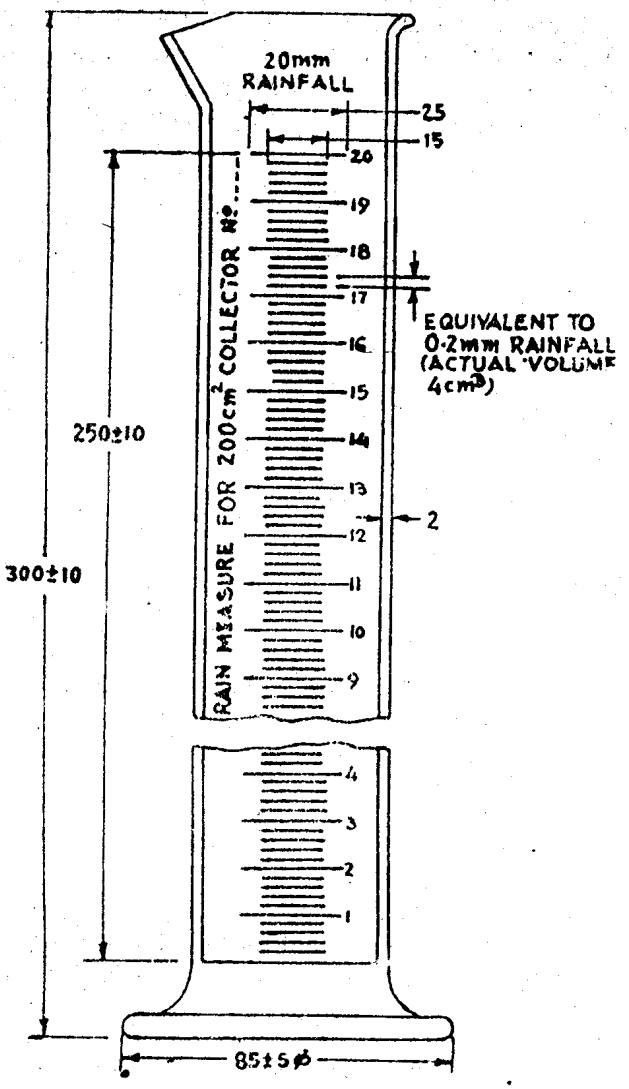
19.7. It is often desirable to protect the gauge from being damaged by cattle, and for this purpose a fence may be erected around it. This can be made of any suitable material, but it must be of such a size that the top of the fence is not higher above the mouth of the gauge than half its distance from the gauge (see paragraph 19.5 above).

It is also desirable to keep the rain-gauge locked and to have it painted periodically to prevent its surface from corroding. The Meteorological Department, Pune, can supply rain-gauges with locking arrangement.

Measurement of the rainfall

19.8. To measure the rainfall the water in the receiver is poured into the glass measuring cylinder which is to be placed on a level surface. The eye is then brought into horizontal line with the bottom of the meniscus, the curved surface of the water, and its reading taken. Each of the graduations on this cylinder represents 0.2 mm. rainfall and the observer must count the number of the divisions covered by the water. In order to facilitate this, number are engraved on the glass at 1, 2, 3, 4, etc; divisions. If the water comes up to the third division above the line marked 2 the rainfall in 2.6 mm. In writing up the amount recorded the observer has simply to put the number of milimetres in front of a decimal point, and double the number of division after it. Thus if he has measured one mm., and three divisions, he writes 1.6 mm. The observer will make no mistake if he always writes one figure after the decimal point.

If there is more water in the receiver than the measure-glass will hold, the glass should be filled nearly up to the top graduation mark and the reading taken. This water should then be thrown away and the above process is repeated till all the water collected has been measured. The total rainfall is the sum of all these measurements. Thus if the measure-glass holds 20 mm. i.e., and the amounts measured are 19.0, 18.0 and 17.0 mm., the total rainfall is 19.0+18.0+17.0 mm. or 54.0 mm.



RAIN MEASURE FOR 200 cm² COLLECTOR (20 mm RAIN FALL)

The rainwater in the gauge should be measured every day at 8.30 A.M. and the raingauge should be examined every day at that hour even when in the observer's opinion no rain has fallen. During heavy rains it must be measured three or four times in the day, lest the receiver fills and overflows; but the last measurement should be taken at 8.30 a.m. and the sum total of all the measurements during the previous 24 hours entered as the rainfall of the day.

If it is raining at the time of observation, it is necessary, to complete all operations as quickly as possible to avoid considerable error.

The receiving bottle, as a rule, does not hold more than 200 mm. of rain.

Snow and frozen rain water

19.8 (A) When the receiver contains snow or frozen rain water, the amounts of precipitation can only be measured by converting the contents into water. To do this a definite amount of very warm water should be accurately measured into the measuring glass, and then added to the contents of the receiver, through the

funnel (which may contain a certain amount of snow or frozen water). The quantity of water added should be sufficient, or a little more than sufficient, to melt all the snow or ice. the exact measurement of the snow or ice in the receiver is thus obtained by subtracting the amount of warm water added from the total amount measured, i.e., the total contents of the receiver, after all the snow or ice has been melted by the addition of a known quantity of warm water.

The depth of the snow determined by plunging vertically a pole or rod graduated in meteric units, into the snow where it lies evenly on fairly land ground should also be noted. To convert depth of snow into centimetres of rainfall, 10 Cms of snow may be taken as rough equivalent to 1 Cm of rain. A number of measurements must be taken and mean depth of snow recorded.

Method for measurement of snowfall only

19.9. "When the precipitation is only in the form of snow, the following method for measurement of snowfall should be adopted:

A square platform of the size of 2 X 2 metres may be made of cement at the ground level in a place where there is least drifting due to wind. A scale may be permanently fixed at the centre of the platform. The scale will be graduated wooden pole of 50 mm square and 4 metre height, projecting 3 metres above the level of the platform with 1 metre grouted below it. The graduations should be in metric units and painted on the four sides of the pole. Another scale in the form of a wooden stick of 25 mm square and of \ suitable length having metric graduation may be also provided to the station. The observer, while taking observation, will first read the scale at the centre for the depth upto which it is submerge in snow. He will then read with the help of the other scale the depth of snowfall at four corners of the platform. The mean of five readings may be taken as the amount of the snowfall.

At the end of each observation, the observer should clear the platform of the snow so that the next snowfall measurement is not vitiated by the snow accumulation which has already been measured.

The mean depth of snowfall in millimetres divided by ten gives the equivalent rainfall in millimetres and tenths.

For information about the snowgauge and more detailed instructions regarding measurement of snowfall, the Deputy Director General of Meteorology (Instruments, Inspection & Servicing), Indian Meteorological Department, Poona-5 may be consulted."

(Rainfall Registration Instructions issued by India Meteorological Department. Edition-1981.)

Breakage of the measure-glass

19.10. It is desirable that every raingauge station should be supplied by the local authority with an extra measure-glass. When the measure-glass in regular use is broken, the spare measure glass should be at once brought into use, and another measure-glass should be at the same time indented for in the manner prescribed in paragraph 19.11 below.

If it should happen that the measure-glass at any station, not provided with a spare one, should be broken, the following arrangements should be made for the measurement of the rainfall during the interval between the breakage of the measuring-glass and the arrival of a new measure-glass. An ordinary cc. measure-glass should be temporarily used to measure the rainfall (the measurement being recorded in the monthly return in fluid cc.) until the broken measure-glass is replaced. In such a case care must be taken to strike out the printed word "millimetres" and to substitute "cc.", which must be clearly and boldly written. In the event of the measure-glass being broken and a cc. measure-glass not being procurable, the rainfall collected on each day must be stored up in a separate bottle and kept corked. Each bottle containing the rainfall for each particular day should be labelled, and on receipt of a new measure-glass the rainfall can be measured and entered as usual.

200 cc. of water is equal to 10 mm. of rain.

Supply of rain-gauages and measure-glasses.

19.11. All rain gauges and measure-glasses, etc., required at rain-gauge stations in India are supplied by Deputy Director General of Meteorology (Instruments, Inspection & Servicing), Poone-5, the responsibility for their accuracy rests, however, with the Meteorological Department, who test them before they are issued. Price list of rain-gauges etc., rules and regulations and indent forms are obtainable from the same office.

Whenever a rain-gauge or measure-glass is required at any station, an indent form A should be obtained from the controlling officer, and after being filled in should be returned to him for countersignature. The indent will be forwarded by the controlling officer to Deputy Director ibid., who will on its receipt send the rain-gauge or measure-glass, etc., direct to the station requiring it, and will recover the cost from the local authority signing the indent unless otherwise directed. The form of indent and the instructions for its preparation are printed as Appendix A.

Miscellaneous expenditure connected with rain-gauge

19.12. All expenditure in connection with the erection, repairs.and removal of raingauges under the control of Deputy Commissioners should be debited to the head "2029 Land Revenue—103 Land Records. Distt. Charges—Office Expenses".

Inspection of rain-gauges

19.13. It is of great importance that rain-gauges should be inspected as the observers often allow large changes to take place in the exposure of a gauge without being aware that action is necessary.

The object of the inspecting officer should be to determine—

(a) whether the instrument is suitably placed and is in good order:

(b) whether the observer can make the rainfall measurements correctly and enter them properly in the rainfall records;

(c) whether the rainfall records are properly and neatly kept up, and are in good order;

(d) whether the observer makes his measurements at 8.30 a.m.; and

(e) whether any part of the rain-gauge requires repair or replacement.

In order to determine whether the instrument is suitably placed and in thoroughly good order he should ascertain—

(1) whether there are any trees growing up or houses being built which are likely to affect the exposure;

(2) whether the gauge is firmly fixed, so that it is not likely to be blown over;

(3) whether the rim, when pressed home, is level. As all gauges are made level when first erected it will not be necessary for the Inspector to use spirit level. he will only need to see that no obvious displacement of the gauges has taken place;

(4) whether the rim or mouth of the funnel is circular. All gauges are accurately measured before being issued, and unless the rim is obviously damaged or out of shape, it is not necessary to measure the diametres.

In order to ascertain whether the observer can measure the rainfall accurately and make entries correctly, the glass receiver should be partially filled two or three times with different quantities of water, and the observer required to measure them and write down the entries. If he can do this correctly, nothing further is necessary; if not, the inspecting officer should teach him fully.

The Inspector should also see that the rainfall book prescribed in paragraph 19.16 is in good condition and the entries in it carefully and neatly made. He should also verify that the rainfall observer knows how to make entries in the various rainfall returns.

New raingauges

19.14. Applications in duplicate accompanied by site plan by District Officers for sanction to establish a new rain-gauge or transfer or abolish an existing one, should be submitted to the Director of Land Records. They should be accompanied by a map of the district showing the rain-gauge stations and should give detailed reasons for the proposals made. Before sanctioning a new gauge, the Director of Land Records should obtain the assent of the Director, Regional Meteorological Centre Observatory, Lodhi Road, New Delhi.

Observatories under the direct control of the government of India.

19.15. Appended is a list of meteorological observatories which are under the direct control of the Meteorological Department of the Government of India. If any rain-gauge or measure-glass at one of these observatories is found to be defective by an inspecting officer, he should not order it to be replaced, but should report the matter to the Meteorological Department of the Government of In dia.

List of Obervatiories

1. Bhunter;
2. Bilaspur;
3. Chamba;
4. Dharamshala;
5. Dalhausi;
6. Mandi;
7. Manali;
8. Shimla;
9. Una.

Register of Rainfall

19.16. At each rainfall station there should be kept, in the form given below, a strongly bound book, for the due care of which the rainfall observer should be held responsible:-

Meteorological Register kept in the office of the _____ of _____ for the month of _____ 19 .

Date	Day of week	Rainfall 24 hour Preceding 8.30 A.M.	Remarks
		Milimetres	
1	2	3	4

Note:-Falls so slight as not to admit of measurement should be denoted in the register by the letter R.

The record of the rainfall at that station from the commencement of observations or in continuation of it should be kept in this "Rainfall Book", and the entries in it should be made as neatly as possible, and every care should be taken for its preservation.

Headquarters register of rainfall

19.17. At the headquarters of a district, the Statistical Assistant will keep a register in the form given below, in which he will enter daily (a) all rainfall observed by himself at the rain-gauge in his charge, if any, and (b) all rainfall recorded at outstations. The rainfall recorded at the outstations will be reported, on each day on which rainfalls, to him by postcard. It is necessary for the Statistical Assistant to keep up the register prescribed in paragraph 19.16.

DISTRICT

REGISTER OF RAINFALL FOR THE MONTH OF _____.

(N.B.—Enter rainfall in millimetres, using english numerals.)

RAIN-GAUGE STATIONS IN THE DISTRICT

Date		Remarks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Contd...

Date		Remarks
23		
24		
25		
26		
27		
28		
29		
30		
31		

Monthly return

19.18. A monthly statement of rainfall should be prepared by the Deputy Commissioner in duplicate in the form printed as Appendix B and despatched not later than the 5th of the following month—one copy, to the Financial commissioner and one copy to the Director of Land Records. The Statistical Assistants register prescribed in paragraph 19.17 will supply all the information that may at any time be required. The remarks recorded by the Deputy Commissioner in the monthly statement should be copied in the register.

If more than one rain-gauge is kept up at any station, the entries in the register should show only the data of one gauge.

The following matters should be noticed under the different heads in the column of remarks:-

(1) The extent and effect of rainfall, if any, during the month, and the proportion of sowings made, i.e., whether 1/2, 3/4 or 5/6 etc., of the expected sowings.

(2) The state of the standing crops all over the district.

(3) The probable outturn-average, good or bad; and, in months when crops are being harvested, the estimated outturn of each important crop in detail for leading classes of soil.

(4) The condition of the healthy stock with reference to the amount and description of fodder and grazing available. Cattle disease, only so far as it affects agricultural operations.

(5) Any disease in towns or villages, if it affects agricultural operations.

(6) The supply in canals, the sufficiency or deficiency of floods from rivers or torrents, and whether the normal area under each class has been irrigated.

Submission of rainfall returns during natural calamities

19.19. At the time of occurrence of natural calamities like excessive rains, hailstorm and drought, the Deputy Commissioners shall submit the rainfall returns through special messenger or through any other speedy media of communication at once to the Director of Land Records and to the Financial Commissioner (Rev.)

Inspection of Rain-gauges

19.20. Deputy Commissioners will arrange to have each rain-gauge inspected twice a year by an officer of rank not below that of S.D.O. (Civil). The points to which attention should be directed are indicated below. If any serious defect is found, it should be reported to the Director of Land Records. Defects should be remedied at once under the Deputy Commissioner's orders. The practice of reporting the results of inspection

by postcard to the Meteorological Department to the Government of India, and to the Director of Land Records will be discontinued.

POINTS REQUIRING ATTENTION

(1) Is exposure of raingauge good? Distance between gauge and neighbouring object should be at least twice the height of that object.

(2) Are any trees growing up or houses being built which are likely to affect the exposure?

(3) Is raingauge firmly fixed in ground? How is it fixed?

(4) Is mouth of funnel 300 mm. above ordinary level of ground?

(5) Is mouth of funnel approximately level?

(6) Is rim of funnel circular, or does it appear to be indented or distorted?

(7) Are measuring-glass and receiver clean?

(8) Test observer to see if he can measure correctly.

(9) Has rainfall been accurately measured at the fixed hour, i.e., 8.30 a.m., since last inspection?

(10) All rainfall records properly and neatly kept up?

Report on the working of rain-gauges

19.21. The Deputy Commissioners will submit to the Director of Land Records on the 20th April for the preceding financial year, a very brief report on the working of the rain registration system. The Director will then compile and submit the State report to the Deputy Director-General of Observatories, Poona, by the 15th May.

Supply of printed forms

19.22. Printed forms of the monthly Rainfall Return and of the district register can be obtained, on indent from Director of Land Records, H.P.

Snowfall Reports

19.23. All the Deputy Commissioners are required to submit reports on snowfall for the months January to May in each year to the Meteorological Reporter to the Government of India direct, a copy being sent simultaneously to the Director of Land Records. A special report should also be sent, if possible, about the middle or end of July.

Matters to be reported on

19.24. The following are the chief points in connection with snowfall on which information is greatly required.

(1) Information of the actual occurrence of snowfall in any portion of the mountain area of Northern India and Central Asia. In connection with this it would be desirable to give as complete data as possible on the following points:-

(a) The period (i.e., day or days) of the occurrence of the snowfall.

(b) The height to which the snowline and snowfall, descended during the snowstorm.

(c) The depth of the snowfall, more especially in passes which are generally accessible, and where its depth can hence be approximately ascertained by making enquiries from the hillmen, etc.,

who use the passes.

(d) Information as a to whether the reported snowfall was probably local in character, or was general and due to a period of stormy weather over the whole region for which the report is drawn up.

(2) Information respecting the snow accumulation during the winter, i.e., of an unusually large or small depth of snow in the mountain area, due to the prevalence throughout the winter of frequent snowfalls or of abnormally dry weather. This, perhaps, might be best judged by ascertaining where possible, by any available way, the depth of snow on the higher well-known passes in the area for which the snowfall reports are given.

(3) Information on any special features of the weather such as abnormal and prolonged hot or cold periods unusual dryness or dampness of the air, late or early sowing of the crops, etc., all such data in fact as would illustrate the general character of the winter and spring, more especially as depending upon the amount of the snowfall in adjacent mountain districts.

(4) Any comparison of the actual snowfall and accumulation of snowfall of the season with those features of previous years, so far as can be gathered from the statements of inhabitants of the district.

19.25. The Meteorological Department will be ready to send meteorological instruments, more especially thermometers, wind vanes and rain or snow-gauges to officers recording or forwarding snow-fall information who may wish to make a more accurate record of the weather and rain or snowfall than is possible by mere estimate, and will be glad to supply forms if required and to give any advice or assistance in its power in connection with such observations.

Fall of snow to be included in Rainfall returns.

19.26. All snowfalls should be included in the rainfall returns on the basis of the calculation given in paragraph 19.8 (A).

Hailstorm reports

19.27. The instructions contained in Rainfall Registration (Revised Edition) issued by Indian Meteorological Department regarding submission of reports on hailstorms reproduced below, may be followed.

HAIL STORM REPORTS

From 1935, the India Meteorological Department has been receiving information on hail storms through the co-operation of the Rainfall Registration authorities in different States. For ready reference, the procedure laid down for hail storm reports by Rain Recording officials at State rain-gauges stations is indicated below.

Hail is precipitation of frozen water in the form of spherical masses or irregular lump of ice. They are partly transparent, and usually occur in association with violent thunderstorms. Hailstones have an average diameter of 5 to 50 mm or more, and may cause damage to livestock, crops and structures.

When a hailstorm occurs at a State raingauge station, the rain recording official is requested to send a report of the hail storm, soon after its occurrence, to the Regional Meteorological Centre or Meteorological Centre at the State capital according to standing instructions. The addresses of these Centres are indicated below:

(1) The Director, Regional Meteorological Centre, Colaba, Bombay-5.

(2) The Director, Regional Meteorological Centre, Alipore Observatory, Alipore, Calcutta-27.

(3) The Director, Regional Meteorological Centre, 4, College Road, Madras-6.

(4) The Director, Regional Meteorological Centre, Nagpur Airport, Nagpur-5.

(5) The Director, Regional Meteorological Centre Observatory, Lodi Road, New Delhi-3.

(6) The Meteorologist-in-charge, Meteorological Centre, Hyderabad Airport, Hyderabad-19.

(7) The Meteorologist-in-change, Meteorogical Centre, Civil Aerodrome, Amause Airport, Lucknow.

(8) The Meteorologist-in-charge, Meteorological Centre, A/6 Vijaya Path, Tilak Nagar, Jaipur-4.

(9) The Meteorologist-in-charge, Meteorological Centre, Meteorological Department, Trivandrum-1.

(10) The Meteorologist-in-charge, Meteorological Centre, Meteorological Office, Civil Aerodrome, Ahmedabad-12.

(11) The Meteorologist-in-charge, Meteorological Centre, H.A.L. Airport, Bangalore-17.

(12) The Meteorologist-in-charge, Meteorological Centre, House No. 1, Bhagat Barzalla, Srinagar-5. (Jammu & Kashmir).

(13) The Meteorologist-in-charge, Meteorological Centre, Civil Aerodrome Office, Gauhati, Assam.

(14) The Meteorologist-in-charge, Meteorological Centre, Civil Aerodrome, Bhubaneshwar (Orissa).

(15) The Meteorologist-in-charge, Meteorological Centre, Civil Aerodrome, Patna. (Bihar)

Blank post card forms for the supply of the report are distributed by the respective Regional Meteorological Centre to the State Rainfall Registration authorities in their region. The cards duly filled in are to be sent to the Regional Meteorological Centre/Meteorological Centre concerned "service bearing". A specimen card with sample entries of a hail storm is given below.

HAIL STORM REPORT

Station_____ District_____ State_____

Date (day, month, year)	Area affected by storm	Hour of occurrence	Duration of storm	Direction from which it came	Approx. size of weight of largest stone	Character of strom	Estimate of damage caused by storm
1	2	3	4	5	6	7	8
25-5-60	About 50. sq. kms.	1610 I.S.T.	About 10 minutes	South-west	About one cm in diameter	Ordinary not violent	A little damage to onion and tomato crops

N.B.: To be posted 'Service bearing'.

Signature_____
Rain Recording Officer

FROM A

Proforma for Indenting FRP Raingauges from Meteorological Department, Poona.

Name of the State:
Name of the Office

Name and designation of the Indenting Officer with complete address.

Sr. No.	Description of article required FRP/measure glasses	Requirements			Total cost of present requirement	Details of advance payment i.e. or Notice	Complete address with nearest Railway Station where the articles to be despatched	Special instructions, if any	Remarks
		Total requirements (with reference of letter)	So far received	Present additional requirement					
1	2	3	4	5	6	7	8		10

Place:
Dated:

Signature and designation of the Indenting Officer.

APPENDIX A
ON INDENTING FOR RAINGAUGES

(a) The Deputy Director General of Meteorology, (Instruments Inspection & Servicing), Pune-5, supplies the FRP non-recording raingagues. The raingauges either bearing ISI certification mark or approved by IMD should only be indented. The raingauge (non-recording) consists of four parts. These are shown in figure 2.

1. Base;
2. Collector (Funnel);
3. Bottle (Receiver);
4. Additional Cylinder.

The last one is to be used only with 100 mm and 200 mm capacity raingauges where there is a risk of overflow from the bottle.

(b) While indenting raingauges or its accessories, care should be taken to specify clearly the exact requirements so as to avoid unnecessary correspondence and consequent delay. It must be clearly stated whether a complete gauge or only a part is required. In the later case, the correct name as given in para (a) above must be used. Official letter with or without printed letter heads need only be used for placing an indent. The cost of gauges and measuring glasses shall be payable in advance by a demand draft in favour of Assistant Meteorologist (Administration) Office of the Deputy Director General of Meteorology (Instruments Inspection & Servicing), Meteorological Office, Pune-5.

The following points may be noted while placing the indent on the Deputy Director of General of Meteorology (Instruments, Inspection & Servicing), Pune-5.

(i) Full details of how and where the gauge is to be despatched must be given. Great care should be taken so that the name of the station is clearly written to prevent despatch to another station with similar name.

(ii) When instruments are to be sent by post, the name of the post office as well as the District in which it is situated should be given and when by railway, the nearest railway station should be distinctly stated. In the later case the name of the Post Office and District should also be given for correspondence.

(iii) Every indent must be signed by the Indenting Officer with his official designation placed under his signature and then forwarded to the Deputy Director General of Meteorology (Instruments, Inspection & Servicing), Pune-5.

The following raingauges of different capacities and other accessories can be indented and are generally held in stock except where specified. The current prices may be ascertained from the Deputy Director General of Meteorology (Instruments Inspection and Servicing) Meteorological Office Pune-5.

Collector	Base	Bottle	Nominal measuring capacity
200 cm^2	Small	2 Litre	100 mm rainfall
200 cm^2	"	4 litre	200 mm rainfall
100 cm^2	"	4 Litre	400 mm rainfall
100 cm^2	Large	10 Litre	1000 mm rainfall

Measure glasses

Description	Measuring capacity
100 cm^2 raingauge	20 mm
200 cm^2 raingauge	20 mm

The base and the collector are locked together by a set of two locking rings fixed firmly to the two parts. Besides, a hasp and staple is provided to permanently lock the raingauge with a pad-lock.

APPENDIX B

Monthly Rainfall Return of the_____ District for the month of_____ 19 .

Paragraph 19.18 of Chapter 19.

Date	Rain Gauge Station in the District														Remarks
1															1. The extent and effect of rainfall, and the progress in sowing 2. The condition of the crops. 3. The expected yield.—At harvest time, note the estimated outturn of each important crop in detail for leading classes of soil. 4. The condition of cattle, the amount and description of fodder and grazing avbailable. 5. The state of the public health. 6. The working of the canal and the sufficiency and seasonableness of river in 7. condition, or of floods from hill torrents. General matters.
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28																
29																
30																
31																
Total																
Number of rainy days																
*Normal number of rainy days.																
Total rainfall for the month.																
*Normal rainfall for the month.																
Heaviest rainfall during month.																

*Notes—

(1) The rainfall should be shown in millimetres to one place of decimal.

(2) The names of stations should be written in the same order as these are published in the local Gazette.

(3) The entries opposite marginal Headings marked* will be made from the data supplied by the office of the Director of Land Records, H.P.

(4) A day with 2.5 millimetres (or 10 cents.) or more should be counted as a rainy day.

(5) The figures should be in the international form of Indian numerals (1, 2, 3, etc.) and should be written up legibly in ink.

(6) (a) If the rainfall observations are not taken on any day for any reason, the fact should be cleanly indicated by the symbol 'X' in the appropriate columns (date and month) of the statement.
(b) The word 'Nil' should be written up only when the rainfall recorded is Nil, i.e., when there is no rainfall on any day.

(7) The statement should reach the office of the Director of Land Records, H.P., not later than the 5th of the month following that to which it relates.

Dated:

Deputy Commissioner.