

Central Board of Irrigation
Publication No 36

THE ROLE OF GLACIERS AND SNOW ON HYDROLOGY OF PUNJAB RIVERS

BY

KANWAR SAIN OBERRISE

M Am Soc CE M Am C Inst. MIE (Ind)

Superintending Engineer,

P W D Irrigation Branch Punjab India



PUBLISHED BY ORDER OF THE BOARD

CD CLASSIFICATION

551 311.12+551 579 2/3.627 14+627 512

+551 578 46 551 46 (18 1+551 508 77

SIMLA

24th April 1946

CORRIGENDUM

- Page 2, Line 2 from top *read* 'recrystallized' for 'recrystalized'
- Page 10 and 11 Table VIII under year 1945 *read* 'Jan' for 'Jun'
- item 2 column May 1944, *read* '956' for '946'
- item 8 column Jan 1945 *insert* '10'
- item 8 column April 1945 *insert* '12'
- item 8 column May 1945 *read* '26' for '2'
- Page 14 Table XI against February Minimum, column 9 *read* '2 459' for '2 59'
- Page 18, Line 10 from bottom *read* 'from' for 'rom'
- Last line from bottom *read* 'melt' for 'ment'
- Page 19 Line 10 *read* 'Snowfed' for 'Snowed'
- Page 20 Line 22, *read* 'D o' for 'D'
- Page 28 Line 2 *read* 'Della' for 'Delle'
- Line 3 from bottom *read* 'Horton RE' for 'Horton RR'
- Page 29 against (18) Wilson WT should *read* 'Saur SR'

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FOREWORD

The Role of Glaciers and Snow on Hydrology of the Punjab Rivers was presented as a paper at the Annual Research Committee Meeting of the Central Board of Irrigation held in August 1945, by Sri Bahadur Kanwar Sam O B E I S E. The Research Committee considered that the subject required wide publicity and recommended* that the paper be published as a Central Board of Irrigation Publication.

The Board at its 16th Annual Meeting held in November 1945 accepted† the recommendation of the Research Committee and ordered that the paper be published as a C B I Publication after it had been examined by Mr A P Watal Chief Engineer P W D Irrigation Branch United Provinces and Dr S K Bannerji Director General, Meteorological Department Government of India. Both of these officers have since reported that it would be useful to publish the paper.

The author has shown in this publication that snow and glaciers form natural storage reservoirs for the Punjab Canals and he stresses the necessity of keeping a proper account of these resources. It should be possible to forecast river supplies from March to June from snow surveys. Such forecasts will be of great help to irrigation engineers for the distribution of available water supplies and the operation of irrigation works particularly the proposed storage reservoirs. Although the study made by the author relates to the Punjab only it is considered that the principles dealt with in this publication will have a wide application.

The Board hopes that this publication will help in focussing attention on the subject and will lead to further studies being carried out throughout India.

N D GULHATI,

Secretary

Central Board of Irrigation

SIMLA

Dated 24th April, 1946

Central Board of Irrigation Annual Report (Technical) 1945, Page 125
†Central Board of Irrigation Annual Report (Administrative) 1945,
Page 78

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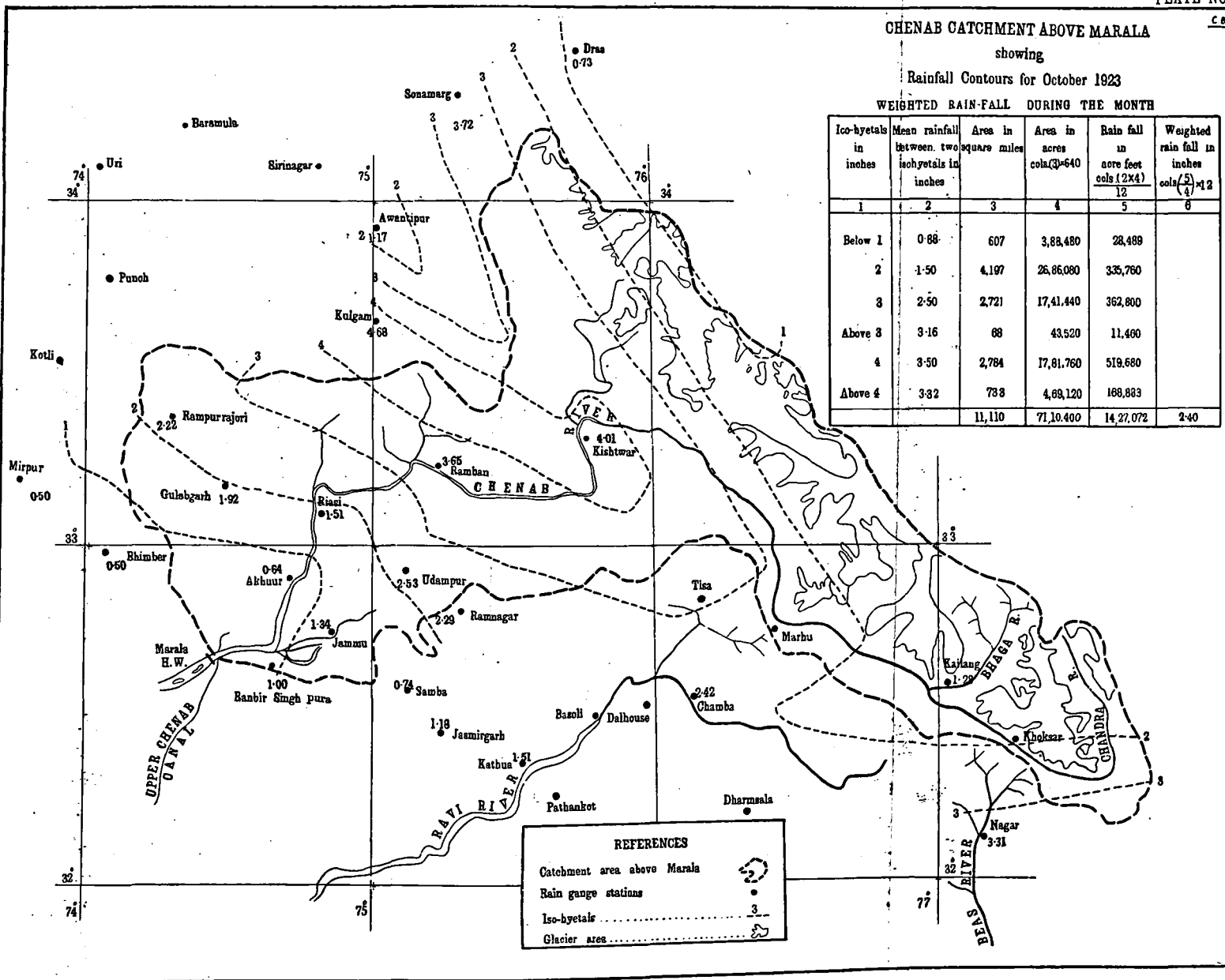
CHENAB CATCHMENT ABOVE MARALA

showing


Rainfall Contours for October 1923


WEIGHTED RAIN-FALL DURING THE MONTH


Iso-hyetsals in inches	Mean rainfall between two isohyetsals in inches	Area in square miles	Area in acres cols (3) x 640	Rain fall in acre feet cols (2) x 4 / 12	Weighted rain fall in inches cols (2) / 4 x 12
1	2	3	4	5	6
Below 1	0.88	607	3,88,480	23,488	
2	1.50	4,197	26,86,080	335,760	
3	2.50	2,721	17,41,440	362,800	
Above 3	3.16	88	43,520	11,460	
4	3.50	2,784	17,81,760	519,680	
Above 4	3.32	733	4,69,120	168,883	
		11,110	71,10,400	14,27,072	2.40




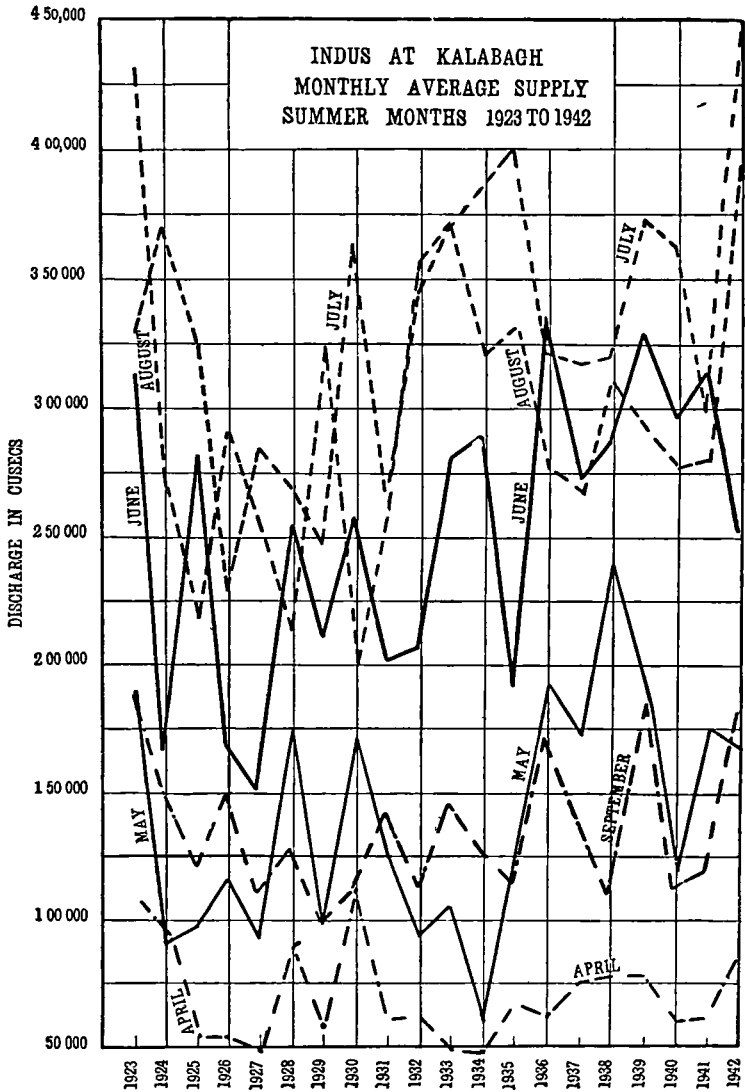
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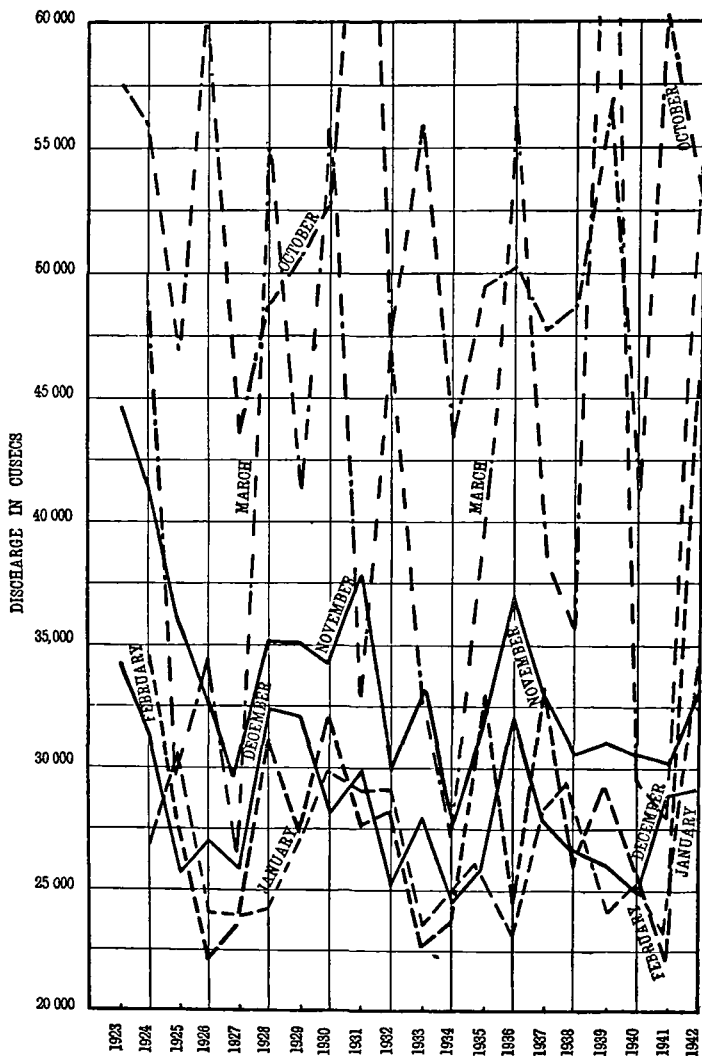
Catchment area above Marala 

Rain gauge stations 

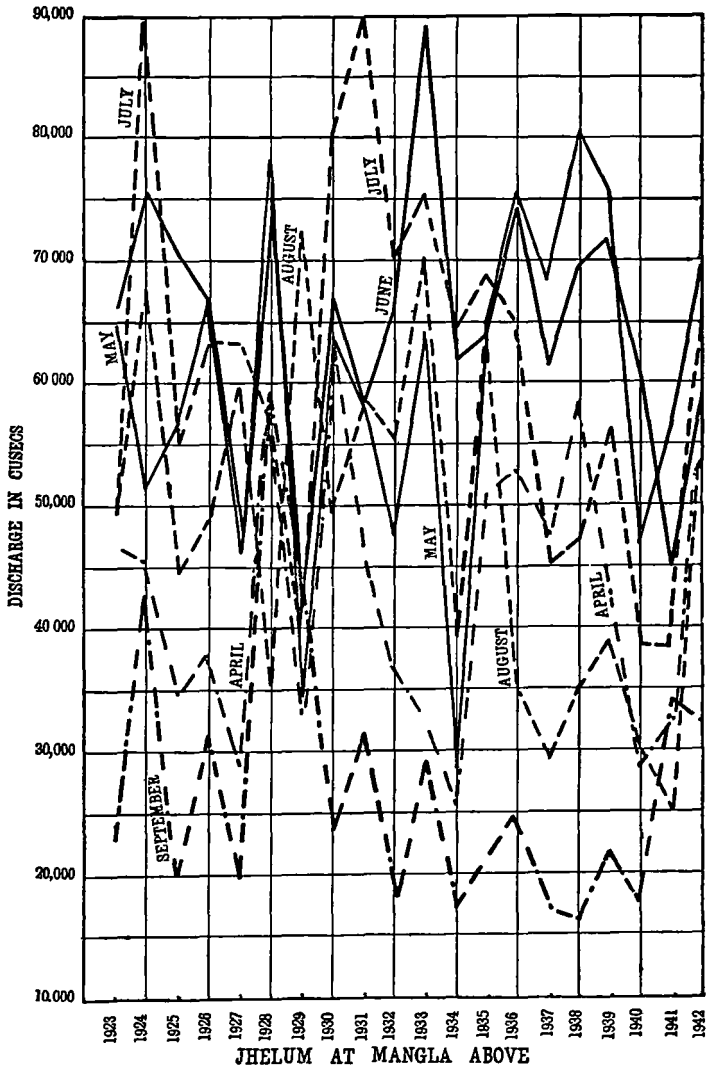
Iso-hyetsals 

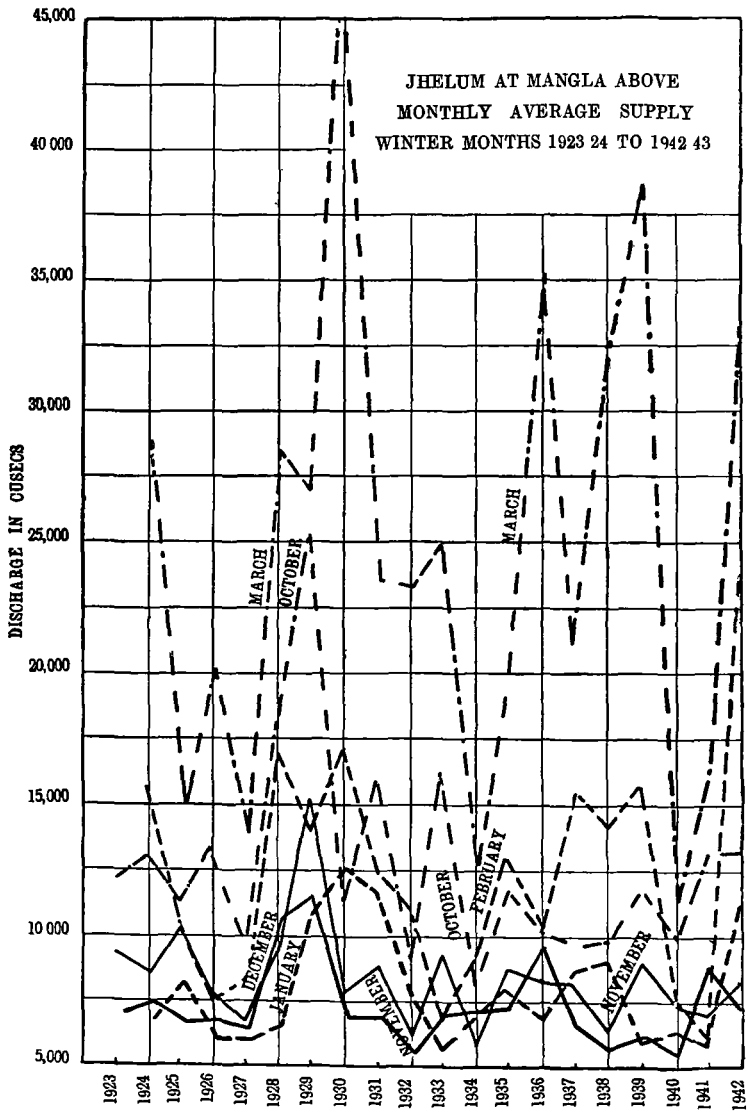
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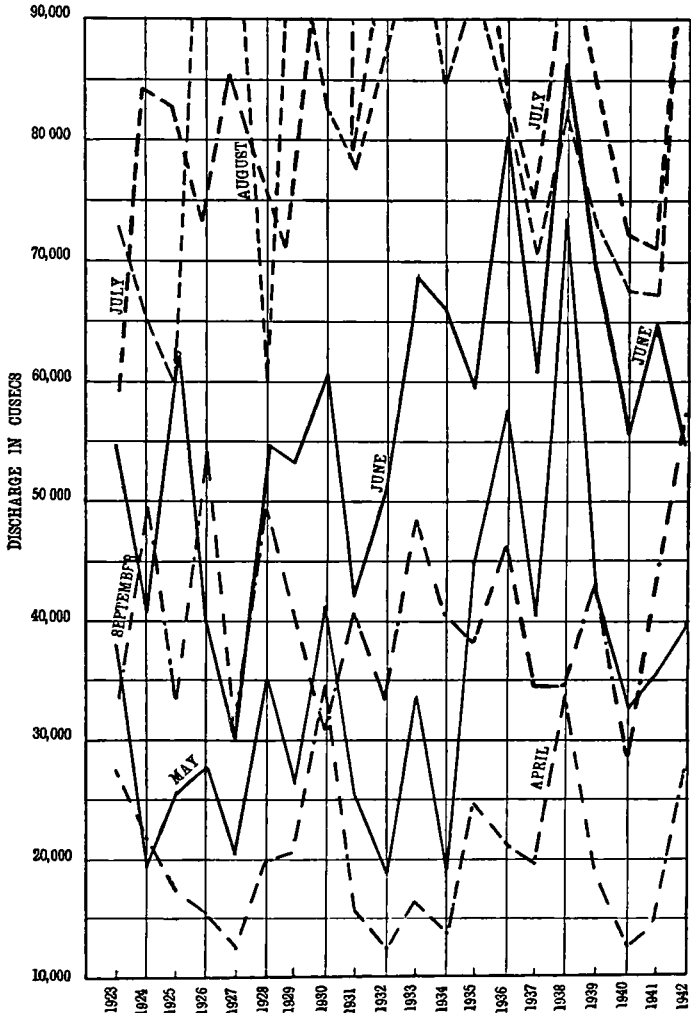




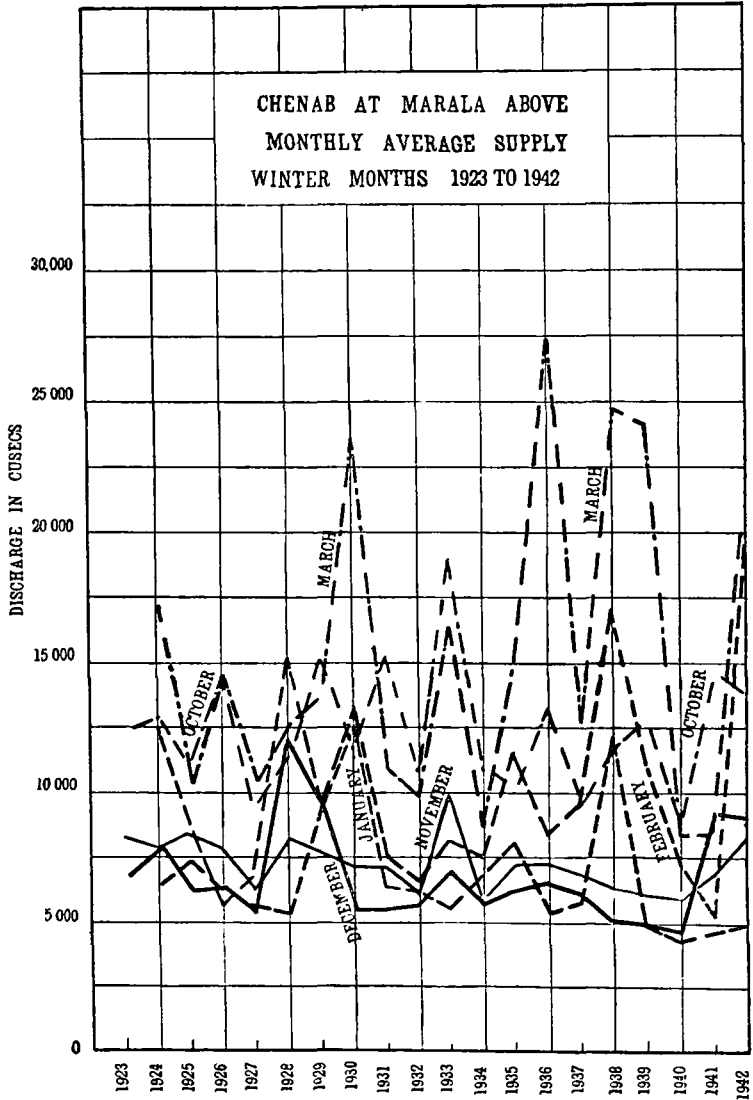
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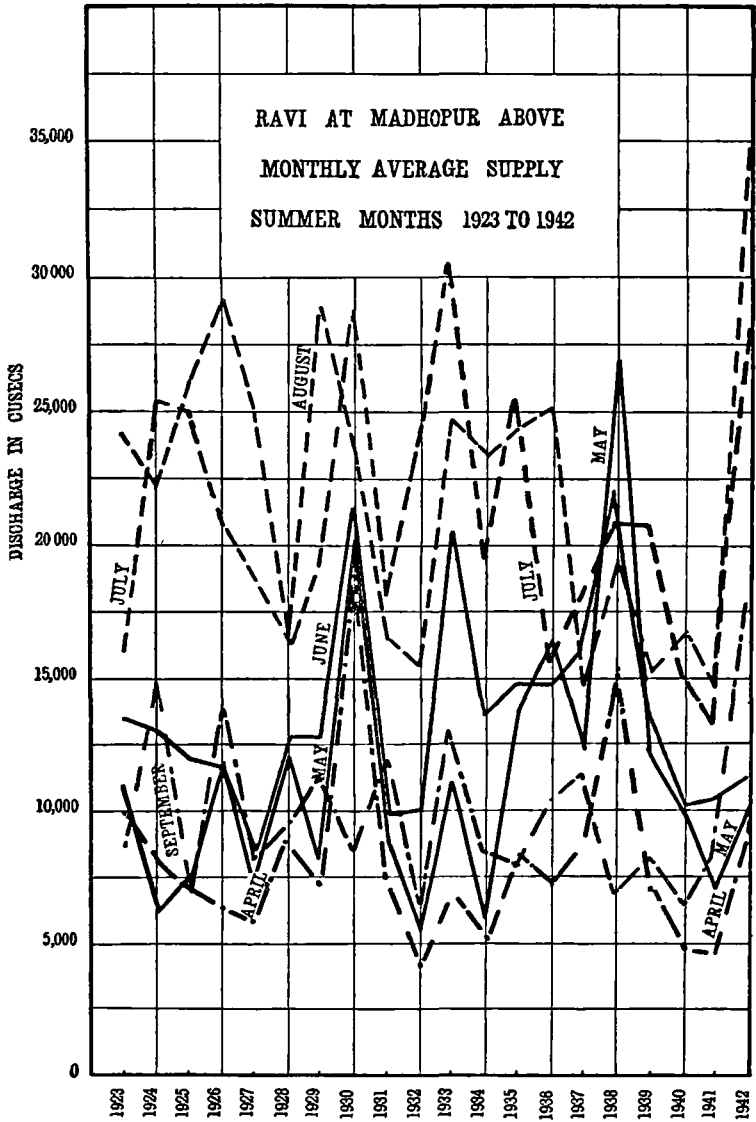


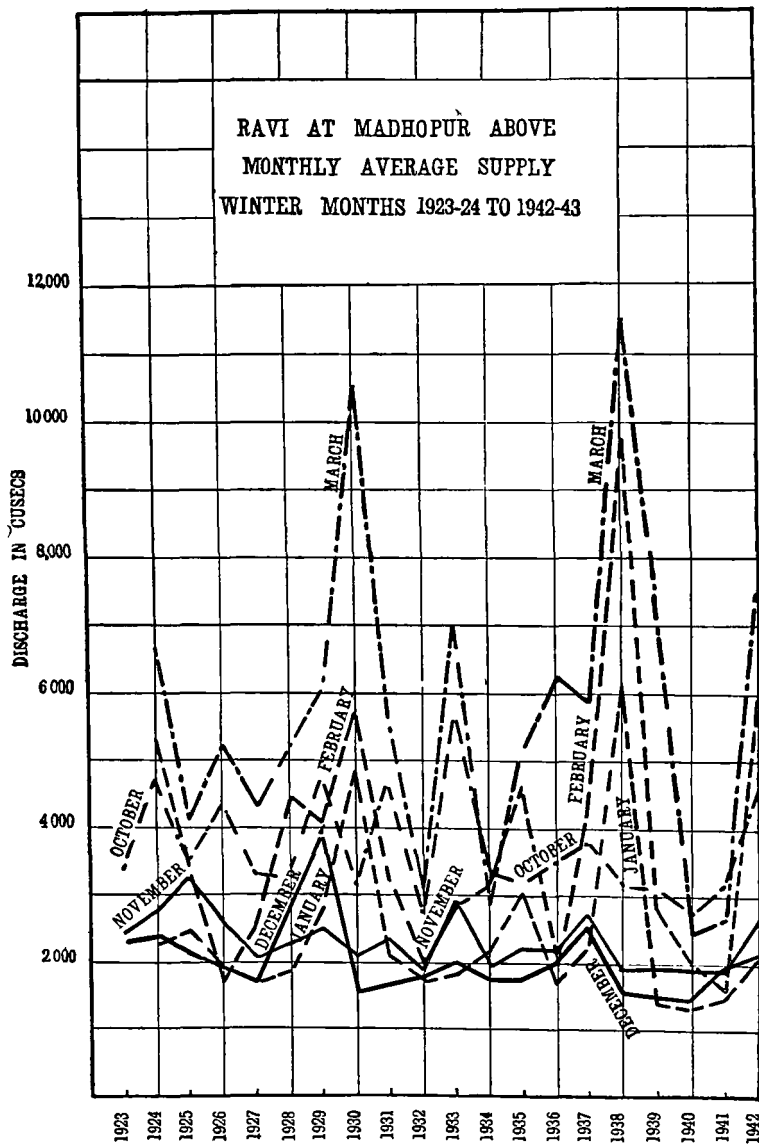


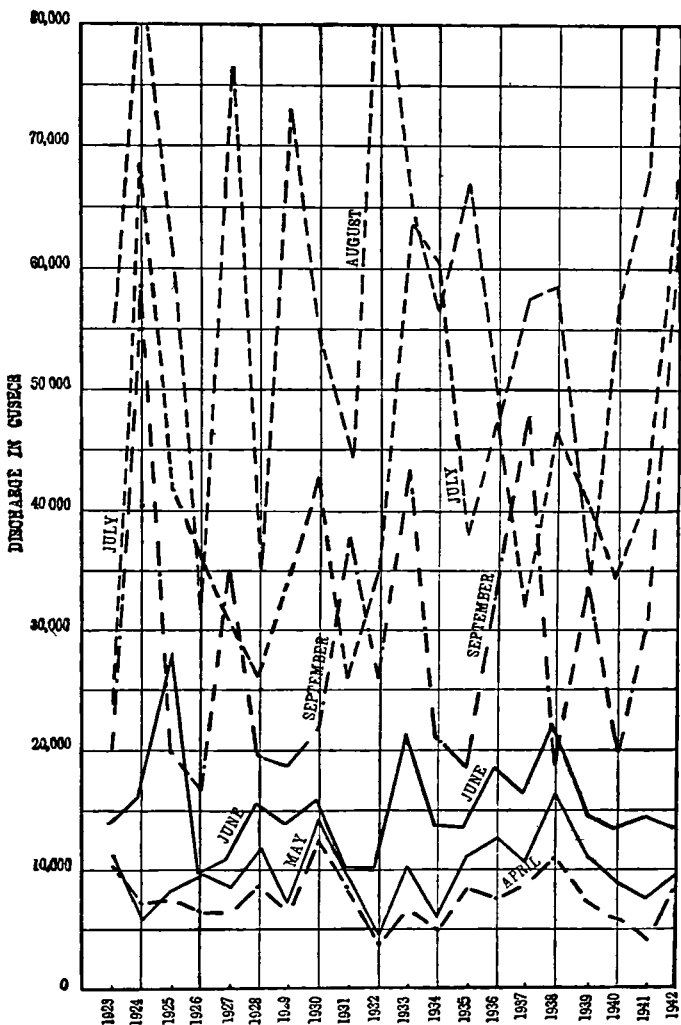


CHENAB AT MARALA ABOVE
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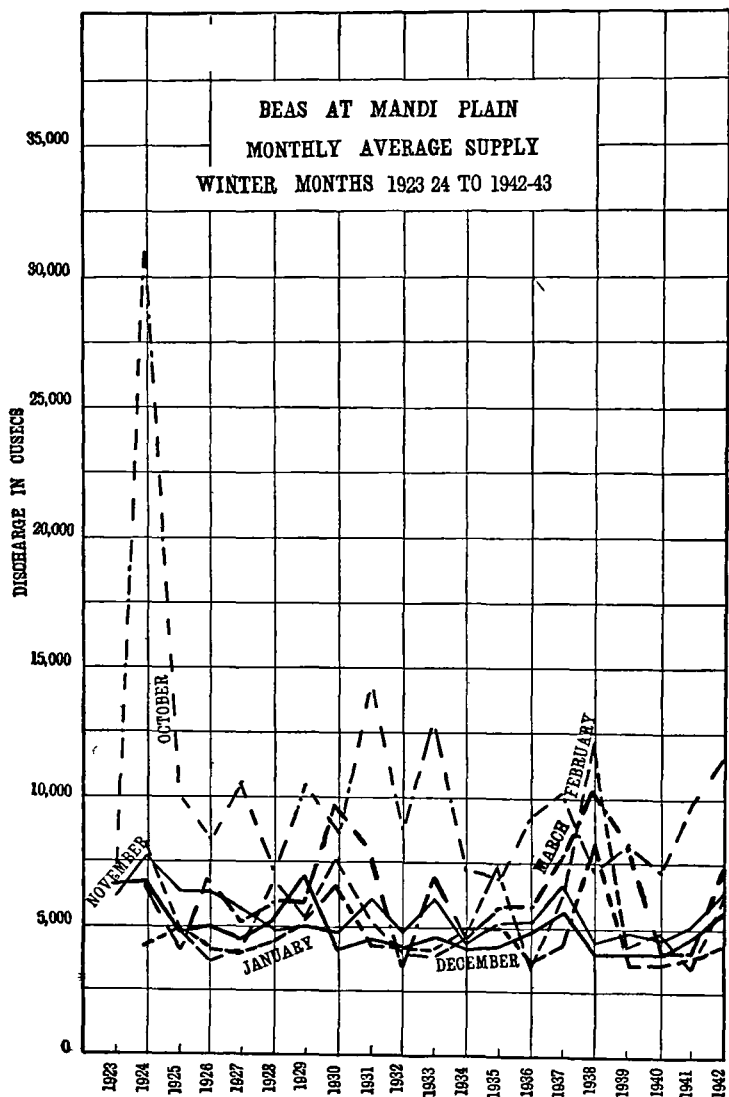


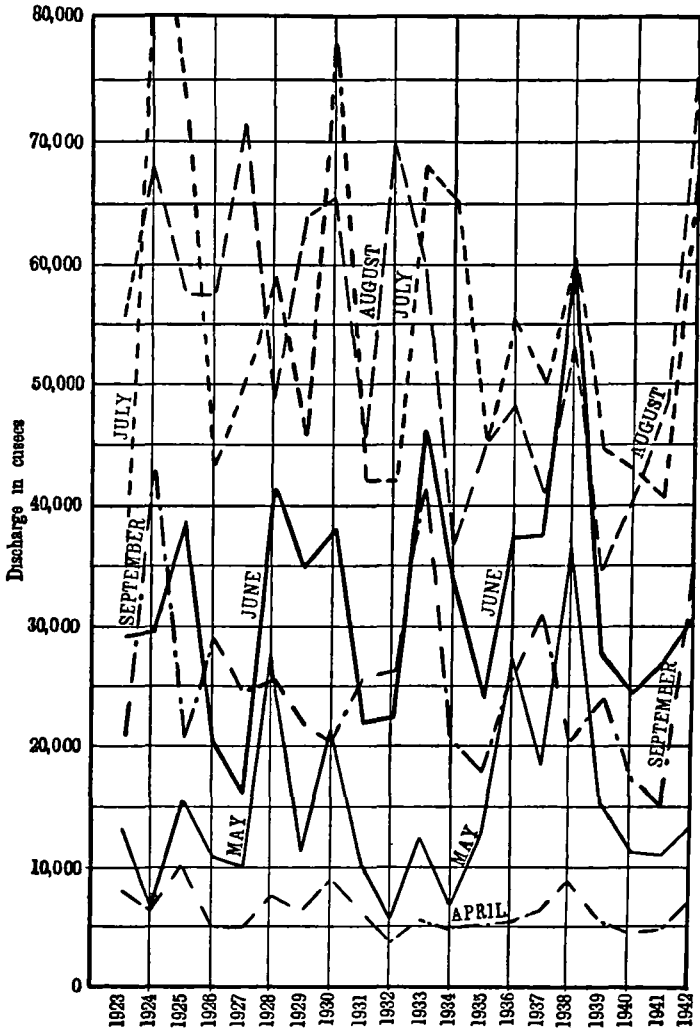




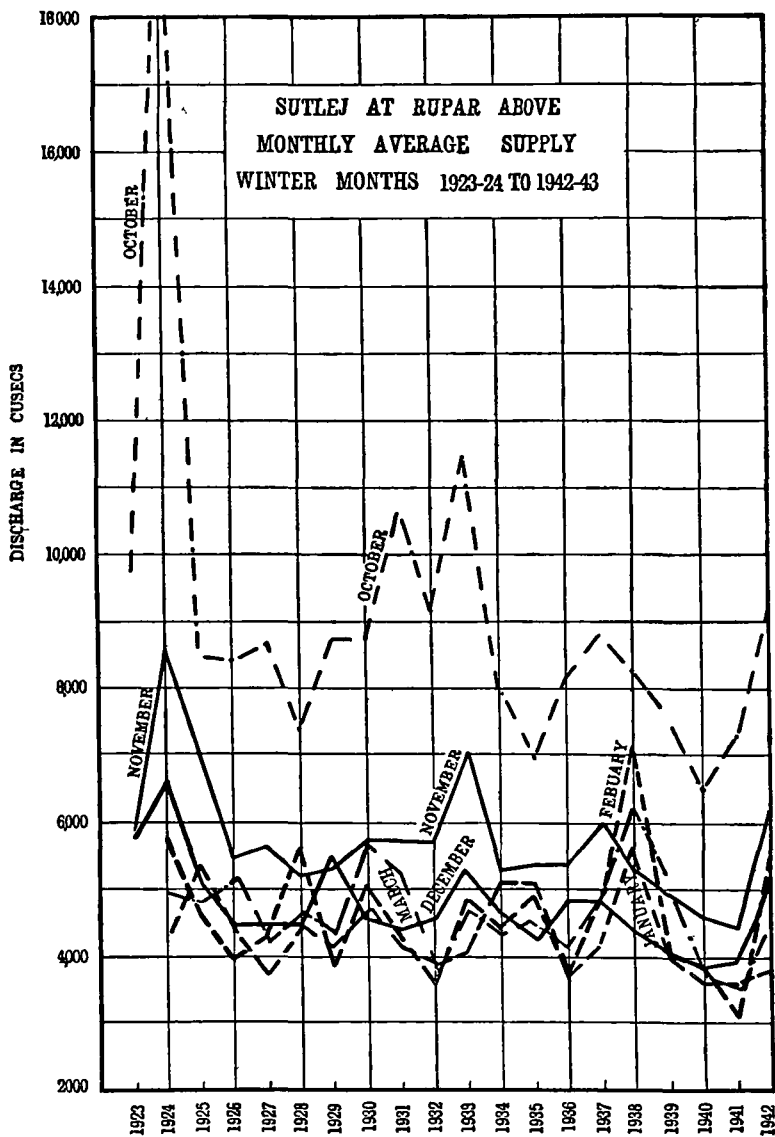


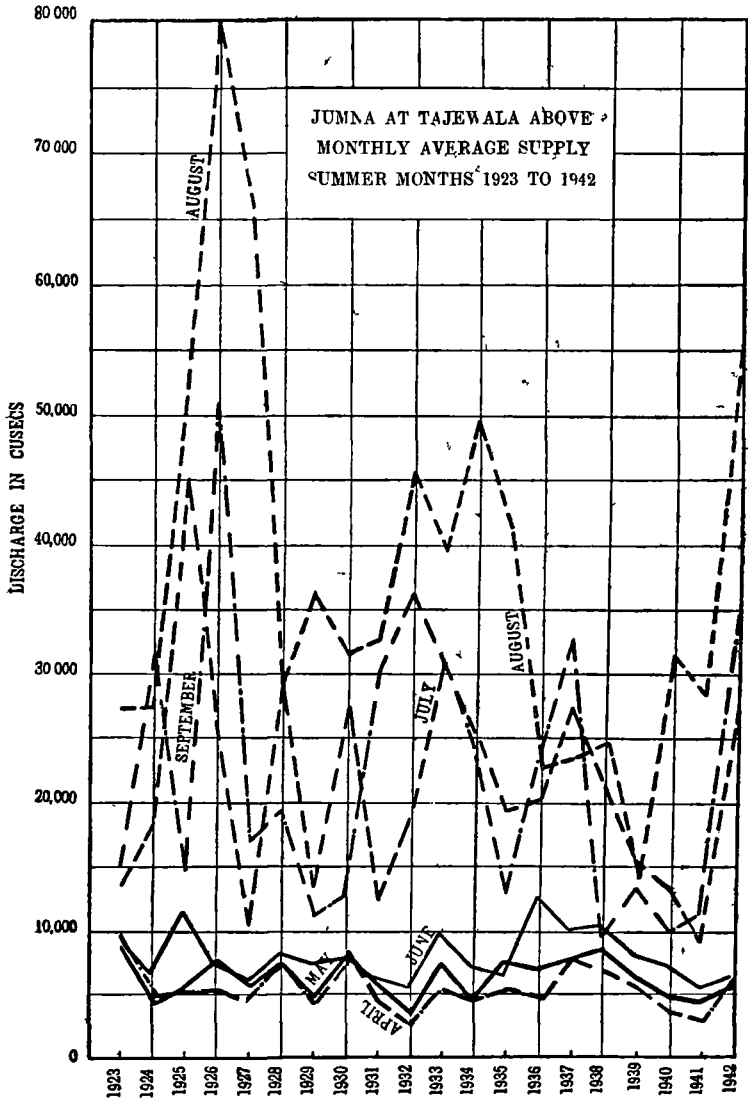
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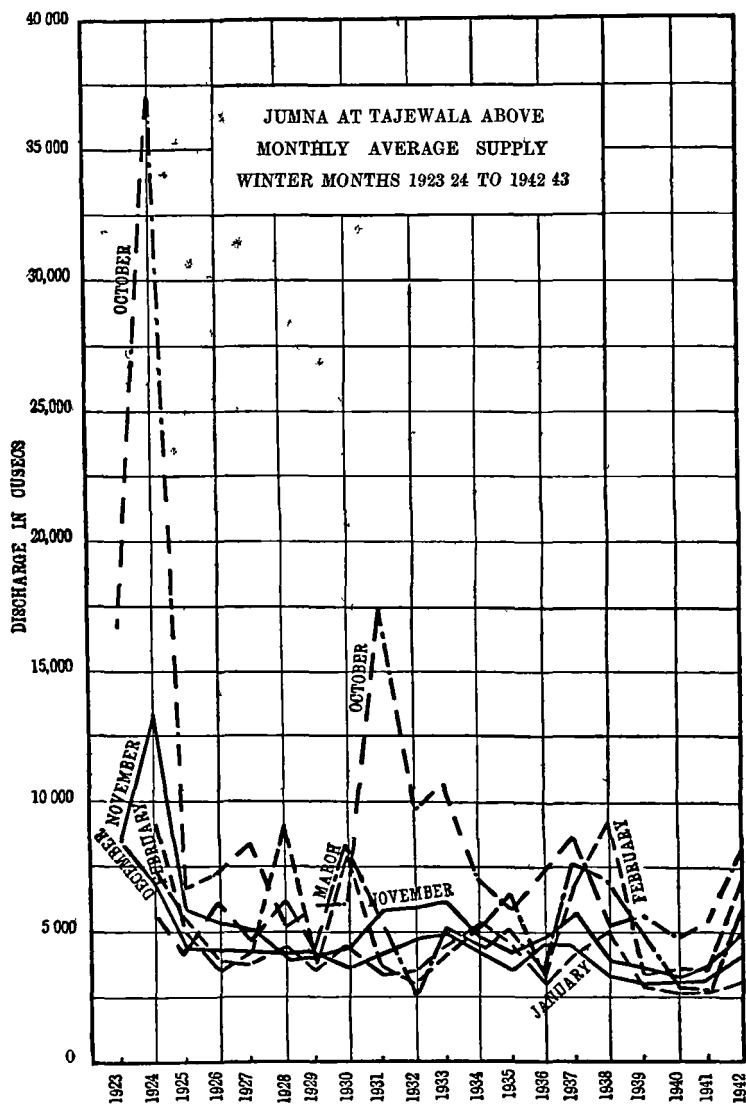




SUTLEJ AT RUPAR ABOVE
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1923 TO 1942







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 - ii Effect of deforestation and afforestation on river floods
 - iii Design of works on sand foundations
 - iv Fluming of canal works
 - v Regulation at canal headworks
 - vi Design of canal falls
- 2 Digest of Technical Notes 1932
 A summary of views of Chief Engineers on the following Subjects —
- i Waterlogging
 - ii Design of works on sand foundations
 - iii Design of canal falls
 - iv Staunching of canals
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- 5 Glossary of Technical and Vernacular Terms in connection with Irrigation in India together with Standard Notations
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