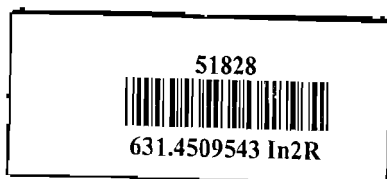


GOVERNMENT OF INDIA
CENTRAL WATER & POWER COMMISSION

REPORT
ON
RAVINE RECLAMATION
IN
MADHYA BHARAT

2011

NEW DELHI
July, 1956



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REPORT
ON
RAVINE RECLAMATION
IN
MADHYA BHARAT

Preamble.—

1. The problem of Ravines in the Northern Districts of Madhya Bharat formed by the River Chambal and its tributaries has been engaging the attention of the Government of Madhya Bharat and even before, also of the then Gwalior State. A scheme for Ravine Reclamation was included in the Agricultural Developmental Plan of the State under the First Five-year Plan and actual work on two Pilot Projects was started in the last year of the Plan. On the basis of the experience gathered, the State Department of Agriculture of Madhya Bharat included a scheme on Ravine Reclamation in the Second Five-year Plan. While including it in the Plan, it was stated on behalf of the Department that the problem of the Ravines was of a stupendous magnitude and that it should be treated as an inter-State problem of the three bordering States of Uttar Pradesh, Madhya Bharat and Rajasthan and further that the reclamation of Chambal Ravines should be taken up through a Central Agency which ought to be technically competent and adequate in resources to deal with a problem of such magnitude. At the time of the *Ad hoc* meeting of the State Ministers I/c. Soil Conservation held at New Delhi on 25th and 26th April 1956, the Madhya Bharat Minister for Agriculture, Shri V. V. Dravid, pressed for consideration, the scheme of Ravine Reclamation.

2. In the beginning of May, 1956, Shri Takhtmal Jain, Chief Minister of Madhya Bharat discussed the question of the Ravines with the Prime Minister and requested that some Engineers should be sent to have a look at the area and suggest as to how the Ravines could be converted into cultivable land. Shri Narsingh Rao Dixit, Home Minister of Madhya Bharat wrote to the Union Minister for Irrigation and Power and drew his attention to the problem of the Dacoit menace in the Ravine area and opined that the "energies of the people living in this part of the country and public funds will continue to be diverted in unprofitable channels unless long term remedies are discovered and applied to remove basic causes of the peculiar crime problem of Bhind and Morena Districts and the adjoining districts of other States". He wrote further "At a time when attention has

been given towards raising the target of agricultural Produce, in the Second Plan, reclamation of these Ravines should be a productive proposition. It will give extremely fertile and new land for agriculture, thus not only adding to the Agricultural Production but also creating more employment. This in itself is bound to have a slow but sure effect on the crime situation. Moreover, in the long run, reclamation of Ravines will progressively deny hide-outs to Dacoits and thus save literally millions of rupees that will have to be spent otherwise in trying to keep the Dacoit gangs in check”.

Formation of the Committee.—

3. In accordance with the wishes of the Madhya Bharat Government, the Central Water and Power Commission proposed a team comprising—

- (1) Shri P. R. Ahuja, Director, Hydrology and Statistics, Central Water and Power Commission (Convenor),
 - (2) Dr. J. K. Basu, Director, Central Soil Conservation Board (Agri.),
 - (3) Shri M. G. Karnikar, I. A. S., Director of Agriculture and Agricultural Production Commissioner, Madhya Bharat,
 - (4) Shri G. S. Sondhi, Chief Conservator of Forests, Madhya Bharat,
- and
- (5) Shri M. K. Shirole, Soil Conservation Officer, Madhya Bharat,



Masonry plug under construction in the Ravine Reclamation Scheme at village Bagchini, District Morena,

and asked them to go into the question of Ravine Reclamation and submit a report early. Dr. J. K. Basu, could not join the Committee on account of his father's death. His place, therefore, was taken by Shri D. C. Kaith, Director, Central Soil Conservation Board (Forests). The Team met at Gwalior on 2nd July 1956. After preliminary discussion and exchange of ideas, the Party left on 3rd July 1956 for inspection of the work done by the Soil Conservation Section of the Department of Agriculture.

4. The conservation activities of the Agriculture Department in the Ravines have so far mainly centred round certain areas of Chhonda and Bagchini villages of the Morena District. Both the schemes consist of two features; namely, contour bunding on cultivated lands bordering the Ravines and reclamation of lands inside the Ravines for cultivation purposes by putting up soil saving dams at suitable levels. The Chhonda Scheme protects an acreage of 372 acres of the cultivated area bordering the Ravines and reclaims an area of about 70 acres inside the Ravines. In the case of Bagchini too, the Technique and Pattern is the same but the scheme is conceived on a more ambitious scale.



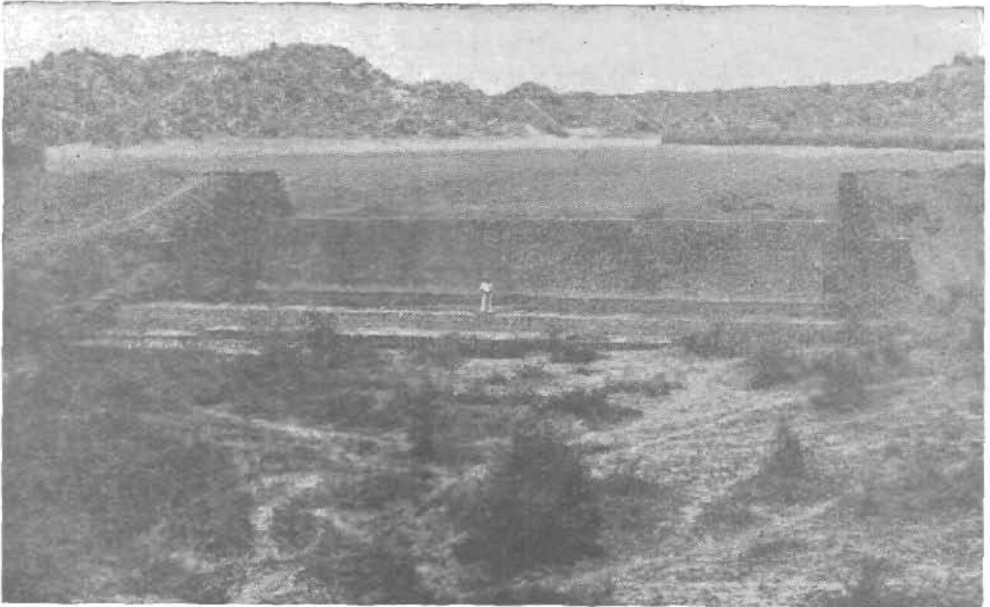
A plug as viewed from the up-stream side showing the steep gully to be reclaimed.

It covers an area of about 1,400 acres of which the area inside the Ravines is 590 acres the rest being cultivated land on the periphery. At the time of our inspection it was found that about an area of 200 acres had been made fit for cultivation. Another 200 acres would further be available for cultivation and the remaining area would be put under grass and forest cover.



A view showing the gully behind the Post Office at village Bagchini and the diversion bund constructed to protect the further encroachment of the gully in the village.

5. The Committee also inspected a soilsaving dam constructed about 25 years back during the regime of the then Gwalior Ruler the late Maharaja Sir Madhav Rao Scindia. The waste weir for this dam



A masonry plug constructed in the Chambal Ravines at village Piparaigaon, District Morena during the regime of the late H. H. Shri Madho Rao Scindia, Maharaja of Gwalior. The site is about 16 miles towards Agra from Morena town on the left side of the Bombay-Agra Road (View taken from down-stream side).

was built in masonry 80 ft. long, 3 ft. top width with suitable side slopes and other protective measure like aprons up-stream and down-stream and return walls.

The bed of the Ravine up-stream of the waste weir is completely silted up now. It is gathered that this silting has been of the order of about 20 ft. over a period of 20 years. The area reclaimed under this scheme is over 60 acres which gives two crops a year.



A view showing the reclaimed area above the plug.

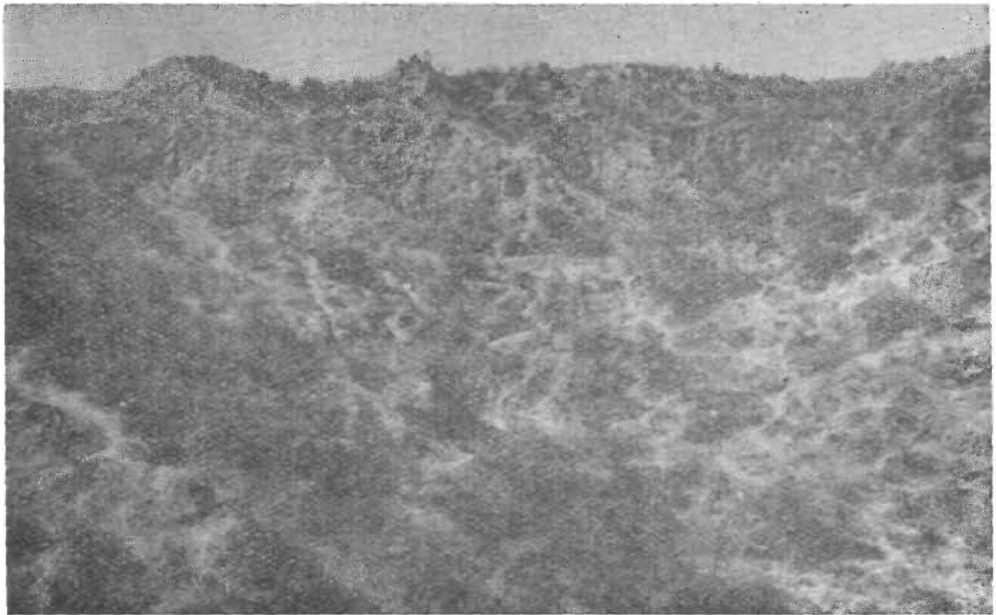
6. On 4th July 1956, the Committee inspected the Ravines in the Bhind District and also the afforestation work done by the Forest Department at Barai, 15 miles North-East of Bhind. The Committee held discussion with the Collectors of Morena and Bhind Districts on various aspects of the Ravine Problem. They also met a large number of villagers of the districts to assess their reactions to the efforts made by the Agriculture Department for Ravine Reclamation. As a result of these discussions, the Committee came to the conclusion that in case of reclamation of lands in the ravines it would be within the limits of economy to incur reclamation costs up to a maximum of Rs. 500 per acre and that there was considerable demand for land.

7. On 5th July 1956, the members of the Committee were received in audience by the Rajpramukh of Madhya Bharat who evinced a very keen interest in the work of the Committee. Discussions were also held with Shri Narsingh Rao Dixit, Home Minister, Madhya Bharat. The Committee members called on Col. Bapurao Pawar, Minister for Agriculture in the Gwalior State who as far back

as 1919 had as Sar-Suba of Gwalior, *i. e.*, Commissioner, presided over the Ravine Reclamation Commission. In spite of his advanced age, Col. Bapurao Pawar showed keen interest in the work of the Committee and gave a very useful background information. The Committee examined in detail several departmental files, maps and reports submitted by various Committees and individual Officers from time to time. The Pawar Commission's report was also gone through very carefully. The available material was found very useful in clarifying the ideas of the Committee members on the problem of Ravine Reclamation and its effect on the general economy of the District.

Problem.—

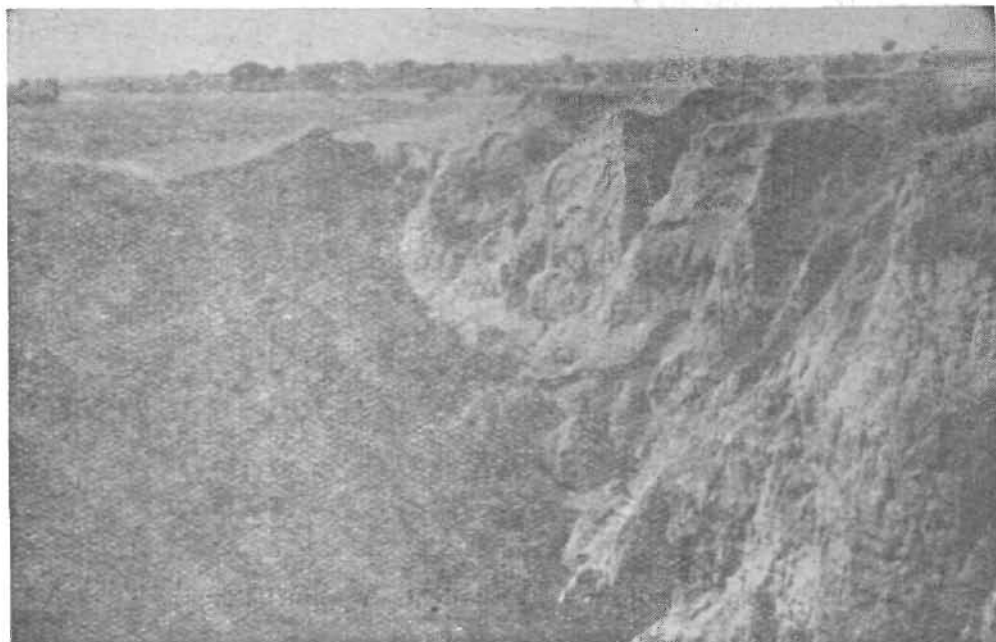
8. The problem of the Ravines is the problem of heavy erosion caused over centuries. On either sides of the Chambal River and its tributaries running through the Northern Districts—particularly the Districts of Bhind and Morena are deeply eroded soils with intercalated layers of *kankar*.



Heavily eroded area adjoining the table lands of the banks of Chambal river.

The uniform pattern of sheet erosion is arrested by a crazy distribution of an out crop of *kankar* giving the River Banks and adjoining lands a ghastly appearance which the Ravines present today. Not only is an extensive area rendered unfit for cultivation by this process which has been going on for centuries but considerable arable lands abutting the ravines have, progressively been transformed into the Ravines because of Sheet Erosion which is induced on them. The steep slopes commencing from the edge of the cultivation and ravine depths of 25

to 100 ft. deprive the adjoining fields of their uppermost organic layers of fertile soil.



A view showing the formation of deep and narrow ravines on the bank of river Chambal.

9. The area under Ravine in the three Districts of Gwalior, Morena and Bhind is about 6 lakhs of acres. The distribution of this area in Tehsils and Districts is indicated in Appendix I. About 12% of the total area of the districts and about 29% of the total cultivated area was under ravines according to the land-use figures available for the year 1950-51.



Steep and high mounds adjoining the village Bagchini (District Morena).



Steep and high mounds adjoining the village Bagchini (District Morena)

Almost the entire area under the Ravines is owned by Government where patches can be cultivated in wide valleys. Land is sometimes allotted for cultivation. The annual land loss is quite heavy though no accurate information is available. At Bagchini, cultivators, whom the Committee members met, told that over a period of 10 years, an area of about 3-4 acres was eaten up by the ravines from a piece of about 20 acres of land close to the Soil Conservation Camp near the village. The Pawar Commission also tried to estimate the annual land loss of about 25 villages and they came to the conclusion that the land loss was quite heavy. A statement of acreage figures of the three affected districts over a period of decade is appended to this report. Its perusal will convince that the annual land loss is quite heavy. The task of urgent importance is the protection of existing lands that would otherwise be eaten up by the over spreading ravines. A rough estimate puts the total peripheral length of the borders of the Chambal system, *i. e.*, Chambal River and its tributaries like Sindh, Asan, Kunwari and Sank at a figure of 1,500 miles. If the average depth of the area to be protected on the borders of the Ravine is 2 miles the total area that would be required to be protected by bunding would come to about 1.9 million acres. The area inside the Ravines is estimated to be at 6 lakhs of acres. Even if 50% of this area is proposed to be reclaimed, the figure would come to 3 lakhs acres. These figures are obviously not very accurate in absence of detailed topographical and land-use surveys nevertheless they can be taken as a broad indication of the magnitude of the problem.

Resume of past efforts.—

10. Before suggestions for the Reclamation of the Ravines are discussed, it is desirable to have a brief review of the steps taken in the past to study the problem and suggest suitable recommendations. As far back as 1919, the then Gwalior State appointed a Commission under the Chairmanship of Shri Bapurao Pawar—the then Sar-Suba of Gwalior. The terms of reference were as under :—

- (1) To suggest ways and means to arrest the further extension of Ravines.
- (2) To suggest means for making available fodder, fuel and agricultural timber to such villages which had no forests nearby.

The following were the members of the Commission :—

- (1) Rao Bahadur Capt. Bapurao Pawar, Sar-Suba, President.
- (2) Dr. Pendalton, Director of Agriculture.
- (3) Mr. Griffin, Agricultural Engineer.
- (4) Brij Rajkumar Mathur, District Forest Officer, Sabalgarh.
- (5) District Engineer, Irrigation.
- (6) Kunwar Raghvar Singh.
- (7) Thakur Kamal Singh of Bijora.
- (8) Major Thakur Gulab Singh.
- (9) Thakur Jor Singh.
- (10) Thakur Kamod Singh of Pancho.
- (11) Shri Biharilal.

The most important recommendations of the Commission were—

- (a) 1,98,339 acres of the Ravine area (out of a total of 3,15,956 acres) should be constituted as a reserve forest.
- (b) out of the area referred to above in (a) 40,000 acres in Bhind and Ambah Tehsils should be put under a regular afforestation scheme.
- (c) the remaining area of 1,17,617 acres to be closed against cattle grazing and against the removal of Forest Vegetation therefrom.

Further the Commission recommended concessional treatment in favour of those cultivators who would put up bunds in this lands bordering the Ravines to protect them from being eaten up by the Ravines.

11. For actual reclamation of land inside the Ravines, the Commission suggested greater concessions. The cultivators who would raise protective bunds were not to be charged any land revenue for a period of 15 to 20 years and the most important further suggestion was the creation of a Fund to finance such works undertaken by private individual cultivators.

12. The report was considered by the then Gwalior Government and a programme was drawn up to implement the recommendations. As a result of the implementation programme some afforestation work and construction of bunds both earthen and masonry was carried out. But on account of financial stringency, the entire programme that had been envisaged, could not be completed. On Reclamation side about 1,200 bunds were put up to reclaim an acreage of about 10,000 acres. On the Forest side an area of 1,200 acres was put under forest in Barai and Kunwari Blocks of the Bhind District. The afforestation programme—like the Reclamation Programme had to wait till the advent of the First Five-year Plan. In the Plan period the Forest Department of the State afforested an area of nearly 4,000 acres of Ravines in different localities.

13. In 1945, Dr. Schuhart—an American Expert on Soil Conservation—was invited by the Government of India to advise and suggest soil conservation measures. He paid a visit to the Gwalior State and toured the Ravine affected areas and made the following suggestions :—

- (a) Contour Bunding starting from the ridge ;
- (b) Control on grazing ; and
- (c) Afforestation.

14. According to him, contour bunding should be done as an essential first measure on lands under cultivation bordering the Ravines. Wider gullies should be bunded with proper bunds and the lands inside the bunds should be prepared, level or nearly so, as is done in the rice fields. The bunding under all circumstances should start from the top and under no circumstances anywhere else.

15. After Dr. Schuhart's visit, the State sent the Director of Agriculture, the Chief Engineer and the Chief Conservator of Forests to Bombay State to study the work of Soil Conservation that was being done in that State. After the return of the party, a scheme was drawn up but nothing came out of it till the time of the merger of the Gwalior State into the new state of Madhya Bharat. After the formation of Madhya Bharat, the Agriculture Production Department interested itself in the problem and sought technical advice from Major Basrur, Mechanical Cultivation Engineer of the Government of Bombay and also from Dr. J. K. Basu, the then Soil Physicist of the Agriculture Department of the Government of Bombay. Their recommendations too were almost identical with the recommendations made by Dr. Schuhart. Major Basrur's recommendations were as under :—

- (a) Reclamation should be restricted only to low basins of the Ravines which were sufficiently wide for formation of sizable plots for cultivation ;

- (b) The existing 15' to 20' wide lanes should be used for diverting rain-water for protection of reclaimed areas ;
- (c) Top cultivated areas should be protected against further soil erosion ; and
- (d) The lower reclaimed basins should be given adequate protection against soil erosion.

16. On the strength of the advice given by the expert, a proposal was submitted to the Government to have a complete contour survey of the entire peripheral area of the Ravines of the Chambal River and its tributaries like Sank, Asan and Kunwari. The proposal was sanctioned by the Government in 1954. But since there was a serious shortage of technical personnel to undertake the work of survey on such a scale it was decided to select a few places where the work of contour survey was started. In another context, *i. e.* alignment of the Chambal canal, an aerial survey of the entire Chambal Command area had been undertaken. Almost the entire Ravine area of Madhya Bharat came under the survey, but it was not contoured. In absence of any contour survey detailed scheme could not be prepared in large numbers covering an extensive area. But, as noted in the earlier part of this note, work on two catchment areas—one in Chhonda village and the other at Bagchini—was started. The programme of work consisted of—

- (1) Contour bunding on the peripheral area ;
- (2) Plugging the mouths of the Ravines at suitable points by either earthen or masonry plugs. Steps to be taken for surplusing arrangements.

At the time of the inspection of both these projects, the scheme had not been finally completed but sufficient work has been done to show the basis on which the work was progressing. The cultivators whom the Committee members met, were apparently satisfied with the programme of execution and stated that, that was the line of work that had to be followed.

Recommendations.—

17. After taking review of the whole material placed before them and after having had discussions with a large number of persons, the Committee came to the conclusion that it was necessary to classify the land for reclamation into three categories, *i. e.*—

- (a) apparently unaffected lands (in relation to the Ravines) being used for raising agricultural crops ;
- (b) the lands affected by various degree of active gully erosion ; and
- (c) the deeply Ravine lands along either side of the rivers—more particularly on the banks of the Chambal river.

The categorisation of lands in three different groups would necessarily suggest different treatments to each of them. The most important step is to ensure—

- (1) that the 'table lands' under cultivation at the head of the gullies is not further encroached upon by the Ravines. This has to be done by contour bunding followed by other soil conservation practice such as contour cultivation, green manuring and proper crop rotation;
- (2) immediately below, these contour bunds and after proper easing of the steep slopes, a belt 1 to 2 chains width should be planted with suitable grasses, trees and shrubs so that the extension of the Ravines towards the table land is arrested and the contour bunds on the peripheral lands protected;
- (3) the Ravines adjoining the table lands extending up to the bank of the river to be bunded at suitable points by soil saving dams with proper waste weirs so that in course of time lands inside the dams get levelled up and brought under cultivation and deeper Ravines to be completely closed against depredation from cattle let loose by the villagers and brought under afforestation Programme to provide fodder, fuel and timber to the villagers round about. Where, however, the gullies open out near the river bank into wide valley it may be permitted to be cultivated under controlled conditions. Some such steps as raising of bunds on cultivated fields, provision of trees or a small green belt of vegetation along the periphery and proper agronomical practices may become necessary.

18. Based on the policy recommended above, the Committee would like to suggest that the future programme should be organised on a long term and a short term basis.

Long term Basis.—

19. (1) In order to prepare realistic Plans and specific schemes detailed contour survey of the ravined area is necessary. The topographical maps available at present do not show contours nor do the aerial survey do that. It is, therefore, recommended that the Madhya Bharat Government should immediately take up with the Survey of India, the question of preparation of contour maps at suitable intervals preferably 1 foot contours if possible of the entire Ravine area.

(2) On the basis of such contour maps of the Ravines, the areas should be classified into lightly eroded and deeply eroded areas. On the basis of this classification priorities for reclamation programme should be fixed. Further, in doing so, care should be taken to see

that the land under the high flood levels of the rivers, should be completely excluded from the Reclamation Programme.

(3) For each of the priorities mentioned above, detailed scheme should be prepared and sent to the Central Soil Conservation Board through the State Soil Conservation Board.

Short term Basis.—

20. The Programme on short term basis may be modelled on the work done under what may be called the Pilot Schemes at Bagchini and Chhonda villages. It is felt that work, during the Second Five-year Plan or till such time as more detailed surveys are available, should be on the pattern of Bagchini and Chhonda. In other words, the work to be undertaken should consist of—

- (a) contour bunding and conservation practices on top table lands ;
- (b) forest and more appropriately green belts on marginal lands ;
- (c) easing of slopes and stabilization of gully head ;
- (d) reclamation of Ravine lands by construction of soil saving dams; and
- (e) afforestation in suitable compact areas,

21. Judging from what has been achieved during the last year of the First Five-year Plan, *i. e.*, 1,000 acres of contour bunding on table land and reclamation of about 500 acres of Ravine lands, it seems probable that the Department of Agriculture with a little strengthening may be able to reclaim an area of 10,000 acres inside the Ravines as also contour bund on an area of 30,000 to 35,000 acres of table land. The State Plan provides contour bunding over an area of 1,08,000 acres on table lands out of which an area of 33,750 acres approximately bordering the Ravines would form a part of this programme.

22. The Forest Department has a plan to afforest 22,500 acres in the Second Five-year Plan. The target figure for the Ravine area is kept at 3,000 acres. It is suggested, in this connection, that as far as possible the afforestation programme in the Ravines should be detailed with the work of Ravine Reclamation to be undertaken by the Agriculture Department, so as to form an integral and a balanced programme of Land Reclamation on watershed basis. It may be worthwhile, to suggest here, that the aerial photographs of the Ravine areas taken by the Survey of India for Chambal Irrigation Project, can be made use of for locating suitable sites for reclamation of the Ravine areas during the short term phase.

Public Co-operation.—

23. It is hoped that it will not be considered amiss, if the Committee were to suggest that in such a big programme affecting the economy of the tract it should be possible to work up the enthusiasm

of the local population and secure their active co-operation and participation. The active public co-operation and participation on the Kosi and other projects should provide a ready model to be followed. This aspect of public co-operation is particularly important in the present case. The social necessity for rousing public co-operation in reclamation in this area is expected to have a bearing on the Dacoit Problem which is essentially economic. As the State Government is treating the Dacoit Problem essentially, an economic and a Social Problem and not purely one of law and order, the Committee feels that it is all the more important that the local population should be actively associated with the work of reclamation of soils and regeneration of their lands.

Use of Machines.—

24. Even when stress is being laid on active public participation, the Committee cannot ignore the fact that the work of Ravine Reclamation and protection of the peripheral table land is of a stupendous magnitude. There is thus a very great scope for use of machines in the work. At the *ad hoc* meeting of the State Ministers I/c. Soil Conservation held at New Delhi in April 1956, Shri David—Minister for Madhya Bharat—urged that mechanical levelling and bunding should not be ruled out but should be tried on an experimental basis on a smaller scale. The Soil Conservation meeting accepted the view and suggested that levelling up of Ravines covering an area of 100 acres by mechanical means should be tried with the help of the Central Tractor Organisation. The contour bunding programme too is also a very heavy programme which if it has to be tackled in a reasonably short period, will have to depend upon the use of machines. It will be interesting to calculate the requirement of machines for such a programme. If a tractor equipped with a bull-dozer were to bund an area of about 1 acre in one hour, working for 10 hours a day and for 125 days per working season would bund an area of about 1,250 acres in one year. A unit of 15 tractors modelled on the Central Tractor Organisation Pattern would turn out an acreage of 18,000 acres in round figures. If, as calculated in the preceding paragraph, the total peripheral area in Madhya Bharat required to be protected is the neighbourhood of 2 million acres the number of years will go up to make a century. Ordinarily for a land Development programme this period is unthinkable. Machines, therefore, will have to be used. The Committee recommends that the Central Tractor Organisation may be asked to prepare estimate for a Pilot Project of levelling and contour bunding an area of 100 acres of near about. The final tests for bringing the machines will depend upon (1) that the Ravines are not very deep and (2) there is a keen demand for land which will be taken up immediately for colonization and that the reclamation costs are not prohibitively costly.

25. The Committee has come to the view that the Problem of Soil Conservation and Ravine Reclamation around the Chambal River is such that it brook no further delay. Some positive and quick steps are necessary (1) to protect the existing lands and (2) to reclaim as much land as possible within bearable economic limits which in the present case is up to Rs. 500 per acre, and (3) to afforest and close areas of deep Ravines. This would secure the best land use, meet the land hunger, protect the soils and raise forests for the benefit of the people around. If the land problem is solved the peculiar problem of law and order will case itself and in course of time completely disappear. The Committee feels that it is not possible to change men's mind overnight but if people have opportunities to occupy themselves gainfully, it will only be few anti-social persons who just for the pleasure or profit of it take to lawless activities. But the law abiding citizens would look upon such activities with disfavour. The Committee is realistic in feeling that the problem of the Ravines cannot be solved in a period a decade or two but given the will and the strength of purpose, it is not beyond the competence of the Nation to tackle it comprehensively within a period of foreseeable future.

Acknowledgements.—

26. The Committee would like to place on record its deep sense of appreciation for the manner in which all information and material was made available to them. They would like to thank the Government of Madhya Bharat as also the officers who ungrudgingly extended all help and co-operation to the Committee in their labour. Committee is, particularly happy to thank Col. Bapurao Pawar, the then Minister of Agriculture of the Old Gwalior State who in spite of his very old age took great interest in the work of the Committee and made very helpful observations which were the result of his life long study of the problem of the Ravines.

(*Sd.*) M. G. KARNIKAR.

(*Sd.*) P. R. AHUJA,

(*Sd.*) G. S. SONDHI.

(*Sd.*) D. C. KAITH.

(*Sd.*) M. K. SHIROLE.

APPENDIX I
Statement showing Ravine areas in the Districts of Gwalior, Bhind and Morena (Madhya Bharat)

District.	Tehsil.	Years									
		1943-44.	1944-45.	1945-46.	1946-47.	1947-48.	1948-49.	1949-50.	1950-51.		
I	2	3	4	5	6	7	8	9	10		
Gwalior	1. Gird	..	4,439	4,696	4,614	4,548	4,429	..	6,255	5,872	
	2. Pichhor	..	28,514	28,481	24,726	25,887	26,803	..	30,239	31,907	
	3. Ghatgaon	..	10,424	10,615	10,715	10,481	10,531	..	9,640	8,921	
	4. Bhandar	..	37,218	37,218	36,772	36,386	35,925	..	37,312	35,470	
Bhind	1. Bhind	..	2,18,797	2,18,797	2,16,573	2,13,873	2,11,656	..	1,96,810	2,07,711	
	2. Mehgaon	..	68,277	68,277	69,289	68,155	66,584	..	58,522	68,775	
	3. Gohad	..	46,906	45,945	45,011	44,148	43,042	..	41,481	39,803	
	4. Lahar	..	1,12,011	1,12,011	1,10,589	1,08,697	1,06,754	..	1,15,146	1,10,477	
Morena	1. Ambah	..	1,52,539	1,50,496	1,47,865	1,45,739	1,43,909	..	1,35,886	1,34,067	
	2. Jora	..	1,22,293	1,21,632	1,20,911	1,20,450	1,19,713	..	1,26,829	1,18,871	
	3. Morena	..	1,00,358	99,628	98,894	98,015	96,882	..	91,423	89,302	
	4. Sabalgarh	..	98,998	98,347	97,761	97,280	96,482	..	1,05,776	1,04,125	
	5. Sheopur	..	1,23,303	1,21,993	1,15,460	1,15,460	1,15,032	..	1,29,451	1,20,226	
	6. Vijapur	..	83,973	83,605	83,017	82,585	81,375	..	1,60,351	1,62,765	
Total		..	12,08,050	12,01,742	11,82,197	11,71,704	11,59,117	..	12,45,121	12,38,292	
In Acres (approx.)	6,04,025	6,00,871	5,91,098	5,85,852	5,79,558	..	6,22,560	6,19,146	

Note.—Wherever there is decrease in the Ravine areas in the subsequent years, it is due to the fact that the lands which were either allotted to the cultivators for reclamation or brought under unauthorized cultivation were removed from the classification of the Ravine area and added to the cultivated area in the Revenue papers. There is, however, a net increase of 15,121 acres during the period of 7 years.