

Maharashtra Central Famine Relief Committee

Report of the Survey of Ghod Valley

1955

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Report of the Survey of Ghod Valley

*A Pilot Plan for preventing scarcities and famines and for
maximum utilization and development of land and water
resources of river valleys in the Bombay Deccan.)*

1955

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APPENDIX I

The Konkan

The Konkan is bounded on the north by the Damanganga river and the Kali Nadi in the south. To the west is the sea-board—the Arabian Sea. The western flank of the Sahyadris forms its eastern boundary. The eastern hill-slopes fall precipitously from an elevation of 2000 ft. to 600 ft. within the width of first 5 to 10 miles from the Ghats and further west in Ratnagiri district the average elevation above sea-level is 300 ft. to 500 ft. while in Kolaba and Thana districts it is much lower. Orientation to the Arabian Sea, the projecting hill features of the Sahyadrian range, the restricted alluvial area, preponderance of laterite in the southern half of the Konkan belt and a fairly dense population partly depending on local resources and partly on emigration are the main features of the Konkan.

According to physical, topographical and climatic conditions Konkan divides itself into five belts or regions. These are (1) the steep western flank of the Sahyadries, (2) the north Konkan, (3) the south Konkan with laterite cover and mineral resources like iron and manganese, (4) the coastal plain developed into garden cultivation of cocoanuts, betel-nuts, plantain, betel-vines, pepper, nutmeg and other spices, cashewnuts and mangoes, kokam and bread-fruit etc. and (5) the large marshy 'Khar' lands along both the banks of tidal rivers meeting the Arabian Sea which have been developed into well protected salt-rice fields and salt-pans to manufacture common salt. The estuaries have great trading centres for exporting timber and other forest produce. Each of these regions, having its own peculiar and common problems, needs be developed on different lines. But some of the important problems affecting the Konkan are broadly indicated below along with their possible solutions.

1. Very steep slopes of the Sahyadrian range and its cross spurs, laid bare by man's continuous vandalism, accelerate heavy denudations during the downpours of rain. The

loose soil at such sites is washed away upto hard rock below, thereby retarding the regeneration of the forest.

2. Forests in the Kolaba and Thana districts are comparatively better off due to flatter ground and gentler slopes and due to proper protective arrangements by the Government. But the tracts in the Ratnagiri district are found to be bare due to indiscriminate cutting down of trees without any attempt whatsoever at replacing. No check appears to have been exercised there by the Government in stopping the depletion of the forests.

3. Heavy floods of hill-streams constitute a periodical menace to villages and cultivated areas.

The solution of these problems lies in developing the steep slopes of the Sahyadri by a planned programme of afforestation, trenching and terracing and training of small and large streams and rivers. Felling of trees and branches of forest growth on hill slopes at least in the first 10 miles from the crest should be strictly prohibited by law and private rights to such practices should be abolished. Cultivation of steep hill slopes should be immediately stopped, including grazing.

Planting of economic trees like aloe, bamboos, hirda, mangoes etc, on the slopes of hills should be resorted to. This will yield raw forest materials in abundance for commercial exploitation as the climate, soil and rainfall are favourable for such development.

When hill slopes are protected by new forests the menace of catastrophic floods will decrease.

4. Cultivated land in the Kolaba and Thana districts is good. But the land in Ratnagiri is poor, the soil is shallow and devoid of organic matter. At present there are no irrigation facilities in the Konkan. Crops are scanty and insufficient for the yearly maintenance of the population. People are, therefore, forced to migrate to industrial places like Bombay for their livelihood.

The land development programme (including afforestation) envisaged above together with small hill tanks and building up of pools in the beds of streams will generally increase the

water supply for use in the post-monsoon months. Irrigation facilities can be made available by canalising the tail-waters of existing and future hydel schemes and partly by pumping water from the running streams by cheap electric power likely to be available from the Koyana Hydel works and also from wells, for seasonal cash crops the manuring of which will improve the soil structure gradually. Increased water resources might facilitate extension of plantations of graft mango and cashewnut, betel-leaves and vegetables, giving good money returns to the farmer. Khar land development schemes, already under way, should be drawn up and extended. This will increase cultivable areas in the Konkan which are none too large at present.

5. Means of communications, especially in the hilly portions, are meagre and badly maintained. Great inconvenience is experienced in the monsoon months when rainfall is almost continuous and flooded nullas and rivers cause serious impediments to wheeled and even to foot traffic.

6. As the sea is within 30-50 miles from the crest of the Sahyadries, the creeks (which were once serving as cheap and efficient means of communications to Bombay and other important parts by country crafts) are fast silting up by colossal quantities of debris washed down from the hills and are becoming difficult for negotiating.

Communications must be improved by expediting the construction of the proposed Konkan Railway and a concreted highway right up to Goa and also by making all-weather-concreted feeder roads from all important towns and villages to the nearest railway stations.

Following the land development schemes, the dredging and desilting of creeks should be taken up, preferably upto the rail line, so as to function again as alternative means of communication by the sea route. The improvement of major and minor ports in the Konkan which is already under consideration of Government will also help in this direction.

7. At present there are no industries worth the name in the Konkan, though its potentialities are great.

With adequate communication facilities coupled with the supply of cheap electric power from the Koyana works, some small and large industries, like manufacture of iron, aluminium and manganese from rich ores and construction of country crafts can be developed, utilizing most of the raw materials produced or available locally. This industrial development will, in course of time, provide employment to a large number of people who are now required to migrate to Bombay and other places.

Fishing industry, both inland and sea, can be extended on the main sea-board by following modern and scientific methods of fishing.

8. In spite of abundant rainfall, there is scarcity of drinking water in the eastern parts of the Konkan. A few wells in deep nalla beds and springs emerging from the toes of hills which thin down to mere streaks in the hottest part of the summer, are the main source of water supply in the hilly tracts just below the Ghats. In villages near the creek and sea-shore, water has to be stored in small village tanks for use of men and cattle during summer. This unprotected water supply results in a heavy incidence of guinea worm (नारु) among the people there, resulting in ill-health and enforced idleness. This disease plays havoc in summer months in some interior villages also.

Proper schemes should be drawn up for tapping water supply from hill streams and storages; though proportionately more costly, they are necessary for providing good potable water to men and cattle of all villages and towns in the Konkan region wherever its want is acutely felt. All the step-wells in Kharpat villages must be converted into draw wells and all drinking water sources must be protected from the contamination of men and cattle.

. APPENDIX II

Baglan system of Bandhara Irrigation

(The following Note is prepared by extracting relevant portions from Beales' Report (Part I) and from the Report of M. Visvesvaraya Committee of 1938.)

The North Deccan districts differ from the other parts of the Presidency by their extensive system of bandharas or masonry weirs with channels taking off on one or both banks. The flow in the rivers and channels is principally during the monsoon and rabi seasons, but a small hot season supply is sometimes obtained. This is an ancient form of irrigation and is now being carefully fostered by the British Government. The system of cultivation under bandharas has reached perfection in what is called the "*Baglan*" - a tract including the Burai, the west Panjhra valley, the Mosum and the whole Girna valley west of Malegaon.

In this part the *thal* or area commanded by a bandhara and its channel, is usually divided into four nearly equal parts, or *phads*, the whole of which is annually brought under irrigation. Each *phad* is subdivided into an equal number of shares or fields according to the number of owners. In any one year, the whole of one *phad* is devoted to rice, another to sugarcane, the third to wheat, gram peas etc., and the fourth to bajri or kharif jowar, etc. All cultivators in a given *phad* are bound to grow the same crop so as to equate their water requirements. Further, they are not allowed to change the rotation of crop pattern fixed by the villagers in advance. In the next year the same crops are grown but on different *phads*, viz., in the following order (1) sugarcane, (2) wheat, (3) bajri, (4) rice and in the next two years the crops move round in the same rotation until in the fifth year they regain their original position. This rotation continues without interruption, the only periods of fallow being the interval between the crops. Manure is put on before the rice crop, and again, by those who can afford, for the sugarcane. This system is termed quadrennial rotation. In triennial rotation the bajri is

omitted; in quinquennial rotation two sorts of rice are grown, superior Kamod and ordinary.

Under *pacca bandharas*, which are not controlled exclusively by the irrigation department, a consolidated land and water assessment was fixed on the area irrigated under the *bandharas* at the time of the survey. The repairs to the *bandharas* are done by the Government from the revenue of the consolidated assessment.

This system of distribution of irrigation water was advocated by some witnesses for adoption before the Bombay Irrigation Inquiry Committee, 1938. Speaking of the *phad* system in a Technical Paper (No. 16, issued in 1929) Mr. C. C. Inglis, I. S. E., Superintending Engineer, Irrigation Development and Research Circle, Poona, has explained why its introduction on major irrigation canals is not practicable. He writes :—

“.....It was not proposed to divide the blocks into *phads* because it was realised that such a drastic distribution of holdings would be impossible ; but it was anticipated that exchanges of land could be arranged between those with land outside the selected blocks who wanted to grow cane in the blocks and those with lands inside the blocks who did not want to grow cane.

“ The cane areas were not concentrated into large blocks and practically the only alteration that took place was that cane areas were standardised by demarcation, but they remained scattered widely over large areas wherever there was a demand for them.

“ The advantages which occurred from the introduction of blocks were, however, very great ; because when the areas were standardised it was possible for the canal staff to distribute water much more economically ; and the cultivators, having an assurance of water for a period of years, found it worth while to carry out improvements to their land.”

The technical difficulties mentioned above do not seem to be insurmountable and serious attempts should be made to find out how this Baglan system of irrigation can be introduced all over the major irrigation works. The system has great

advantages from the administrative and financial point of view. Its introduction will, in addition, simplify irrigation rules and give relief to irrigators. Besides, this system will appreciably reduce overhead administrative expenditure and thereby increase the returns on the capital outlay. The Sub-Committee would, however, suggest that this system should be tried as an experiment on all new schemes, especially in the famine tract, where introduction of co-operative and collective farming should be the policy of Government. It may be worthwhile to try it in some favourable areas irrigable under the new Ghod canals.

APPENDIX III

A Note on the Irrigational Potentialities of the Bombay Deccan

Mr. H. F. Beale's Report on the Surveys for protective Irrigation Works in the Deccan (1909) gives in Table I on pages 2 and 3 a comprehensive list of projects with the corresponding sites of storage tanks in cases where they were surveyed and other useful details of 32 possible protection works in seven valleys from north to south viz. Tapti, Godavari, Bhima, Krishna, Ghataprabha, Malaprabha and the Tungabhadra. There were in addition some existing irrigation works in working condition. Out of the 32 works, Nasik Canal at Gangapur, Pravara Project with storage at Bhandardara, Godavari Canal with storage at Darna Dam, Koyna Project with storage at Helwak and Gokak Canal, are either already constructed or are in different stages of construction. Survey and preparation of projects are in progress or ready for some other works like the Tapti Project with storage at Hatnur in East Khandesh, Girna Project with storage at Panjhan, Mula Project with storages at Chas and Mandvi, Kukdi (now changed to) Ghod Project with storage near Annapur, Mutha Canal extension from a new higher dam at Khadakwasla, Nira canals on right and left from Vir storage, Daddi storage project for Gokak and Ghatprabha Right Bank Canal. The remaining projects are yet to be taken up for survey and further investigation, like the Tapti Project with storage at Sustti, Kadva Project with storage at Palkhed, Aundh Project with Storage at Mukne etc.

On page 65 of the Report, Mr. Beale states that he was directed to make a hydrographical and hydrological survey of a certain portion of the Bombay Presidency in which an unfailing supply of water could be relied upon and where also this water could be used for the irrigation of lands liable to a very fluctuating rainfall and to occasional droughts. His surveys and investigations were therefore mainly restricted to Ghat-fed rivers and to sites of storages or weirs suitable for leading the unfailing water to famine districts in the eastern

Desh tract. His sites for storages are, therefore, mainly found to be situated in Deshi Maval or Transition tracts so as to reduce the cost of unfruitful length of canal in the upper hilly region.

For the overall advancement of the region, however, all suitable sites of storages, small or large, in the first belt of hilly tract will have to be investigated and taken advantage of for storing as much of the rain water as possible for various uses and a fresh detailed survey of all such sites is, therefore, indicated.

APPENDIX IV

Formula of Permissible Cost of Protection Irrigation Works

One of the members of the Sub-Committee has suggested the following tentative formula for calculating the permissible cost per acre irrigated under protective irrigation works proposed to be financed as protection against famine.

Suppose there is a district or tract subject to periodical famine.

Let its population be x .

Then the area that should be irrigated for purposes of famine relief may be about $0.5x$ to $0.3x$ according to the judgment of the officers concerned.

Suppose we take it as $0.4x$.

Suppose area already irrigated is y .

Further area which needs irrigation is then $(0.4x - y)$ acres.

Suppose the annual average cost of famine relief for the last 25 years, including direct relief, remissions of revenue and all incidental measures and expenses is "F".

Suppose the net revenue due to irrigation is r and the rate of interest is i (say $3\frac{1}{2}$ per cent for such works.).

The formulæ for calculating permissible cost per acre would be :

$$\frac{100}{i} \left[P \frac{F}{0.4x - y} \div r \right]$$

The factor P allows for :—

- (a) the increased produce of the State and insurance against famine.
- (b) the increased incomes and welfare of the people.
- (c) increase income of the State by way of increase in income-tax, railway freight, several taxes incidental on increased produce.

(d) value of crop saved in famine year and bad years.—

In Uttar Pradesh State this factor, it is understood, is usually taken as 3.

This would mean, speaking very roughly, that if conditions are favourable, the cost of top-priority protective irrigation works for relief of recurring famine may be as high as double the cost of a real productive irrigation work ; which cost is usually represented by the capitalised value of the net revenue obtained from it.

Irrigation works (a) saves crops in famine years ; (b) ensure good crops in bad years ; (c) increase the out-turn of crops in ordinary years ; and (d) benefit the crops even in best years as stated by an eminent Engineer.
