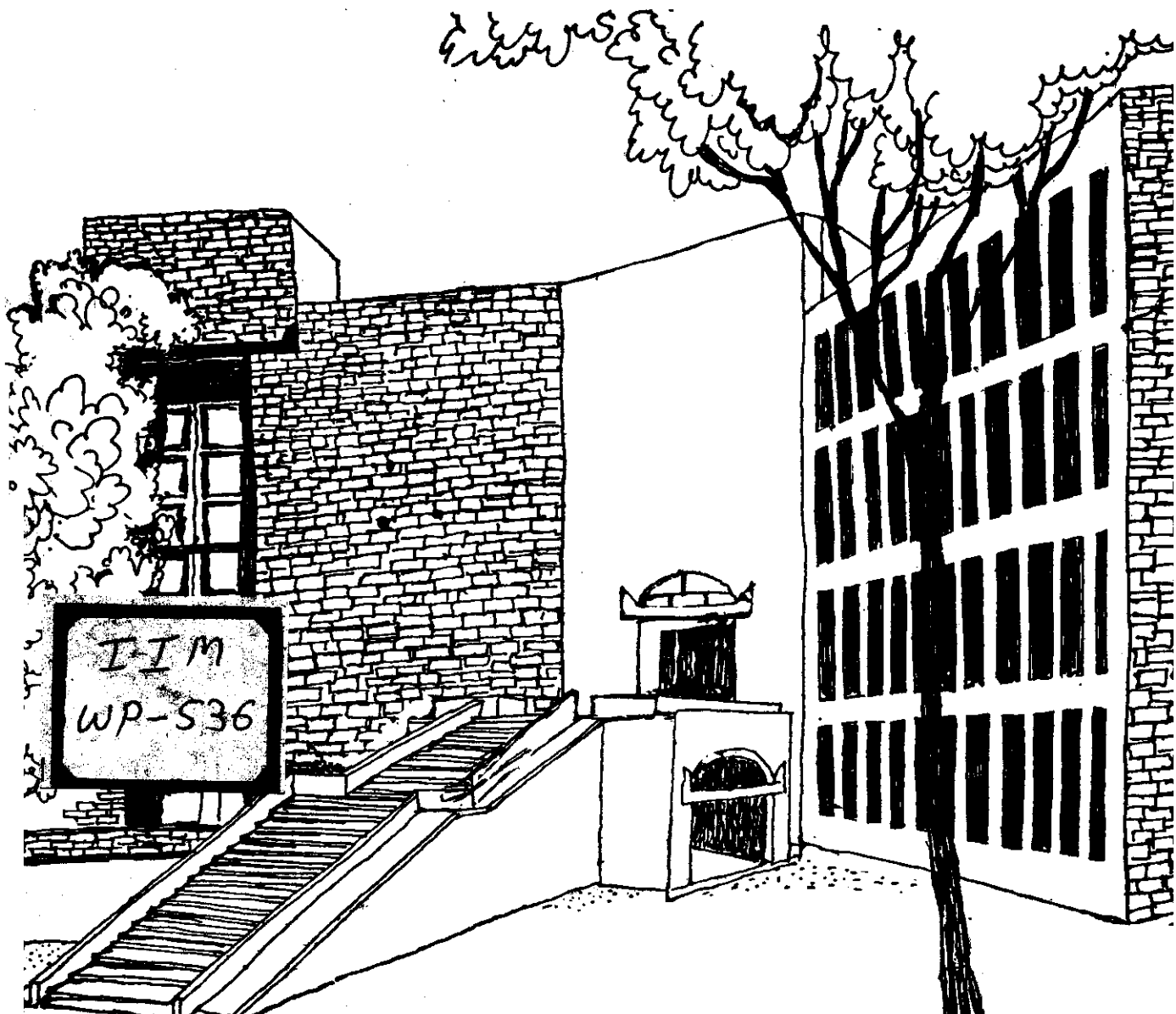


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Working Paper



ANALYTICAL REVIEW OF SELECTED CMA
STUDIES IN DRY REGIONS: 1973-1983

By

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ANALYTICAL REVIEW OF SELECTED CMA STUDIES IN DRY REGIONS:
1973 - 1983¹

There have been numerous studies having a bearing on the problems of dry regions. We have selected few studies which in a way reflected the variety of conceptual, methodological and analytical approaches. Main distinctive feature of CMA enquiry into the problem of dry regions has been the adoption of action-research perspective involving empirical enquiries as well as making process and structural interventions. Some of the important efforts have not been adequately dealt with here either because these studies did not fall strictly within the domain of CMA or in some cases, the material was not easily available. It is also possible that some other studies which were relevant somehow got inadvertently ignored.² To that extent, the limitation of this review hopefully, would be appreciated. Some other studies* have been only listed and not reviewed, either because a recent extensive review of these studies has been recently attempted elsewhere³ or the same were not available for reference.

¹ This review includes most of the studies having bearing on dry regions (including drought prone tribal region) which I could easily lay my hands upon. The comments on different findings reflect limitations of my own knowledge. I might have erred in interpreting some aspects which I will request the concerned authors to kindly point out.

² I would appreciate very much if the same were brought to my notice

³ See my, a) Small Farmers Household Economy in Semi-arid Regions - CMA Project report forthcoming.

b) "Future Research concerns in Dry farming Regions: A Self Critical review" 1984 and "Agenda for future research in Dry regions: Socio-ecological perspective", 1984. The note 'b+c' include review of largely only my own studies except a few of others.
I am thankful to Prof. UK Srivastava for having suggested development of this note as well as note 'b+c' mentioned above. I must than Shri SN Chokshi for helping in compiling various CMA studies and preparation of bibliography.

REVIEW OF CMA STUDIES REGARDING DRY REGIONS

D.P.A.P.

There have been several studies of the various aspects of drought prone region ranging from technology, socio-economic situation, migration, poverty to administrative structure, etc. Apart from the routine academic studies, main highlight has been the action research programme involving academics more intimately within the processes of rural change and development in such regions. We will briefly review some of the important studies mainly to highlight the thrust of CMA inquiry in this regard. The earliest studies in dry-area agriculture were initiated in 1972-73 when Dr. Krishnaswamy along with Mr. KV Patel began an action research exploration for dry land agriculture. The major emphasis was to benchmark the status of dry land agriculture in a district of Gujarat and Karnataka each. After identifying the key constraints, the lead bank was to be involved to finance and follow up the important technological interventions. In fact, financial aid was linked with condition that recipients would have to follow a package-of-practices advised in the programme. A local co-ordinating committee was set up, involving chief scientists of ICAR regional project, Deputy Director - Agriculture, Manager and field officers of the local bank.

The first part of the report included a comprehensive review of various research projects for dry land agriculture beginning from Royal Commission of Agricultural Report, 1928, Bombay Manjri Dry Farming Project (1923), to more recent efforts of ICAR. The adoption of given technology was related to various structural and sociological features

including access to media and extension agencies. The major technological interventions during this period were contour bunding soil conservation; improved seed; improved crop varieties of cotton, groundnut, jowar, bajra etc., application of chemical fertilizer; plant protection practices and other agronomic practices etc. After documenting the current status of technology, the gaps were identified. One of the most important findings of this study was that experience of irrigated areas, particularly for agricultural extension will not be relevant for extension agencies in dry regions.

The resource constraints which prevented better utilisation of soil and moisture were discussed in second volume of the report (1973) providing economics of dry farming. The key findings were following:

- (a) 40 per cent of total livestock was accounted for by the bullocks amongst the poor farmers.
- (b) Poor draft power was the key constraint to better implement use.
- (c) Quality of bullocks increased with the increase in size of land holding.
- (d) Irrigation was more at the level of bigger farms
- (e) Traditional technology generated deficits in the household budget of most farmers.
- (f) Income from livestock was one of the main sources of income for poor people
- (g) Scale of finance chosen by banks for dryland was highly inadequate.

Krishnaswamy and Patel reported the findings of action programme separately (1974). For certain logistic reasons, the project could be taken up only in Karnataka. It was found that (a) the action programme participants were generally the better endowed farmers compared to the

bench mark average, (b) two of the key factors influencing the good or bad performance of technology were the type of soil that farmers had and the agronomic practices used; (c) in general, the hybrid Jowar performed better than the local varieties compared to improved varieties of groundnut.

The key recommendations relevant for financial institutions were:

- a) For developing dry land agriculture the term loans should extend to at least three years cycles for repayment purposes.
- b) The whole approach of lending in dry regions including systems-procedures, risk fund etc., should be differently conceptualised.

Despite the fact that these earlier studies, mentioned above, broke a new ground in the field of management of dryland agriculture and improvement in institutional delivery system, somehow, the banking system which collaborated in this study did not absorb most of the findings as a ^{part} of its overall corporate policy (though this particular bank had one of the most impressive record in innovative agricultural finance policy). The reason for non-adoption were not pursued by the authors.

The next major effort at the Institute for unravelling the complexity of dryland economy was launched almost at the same time in the form of an action research project for tribal region, known as Dharampur Project. There were several distinctive features of this project which in a way extended the very meaning of management approach to developmental problems by highlighting the activist role of academics and social scientists in generating answers to problem of poverty. Apart from empirical results of this study, efforts were made for involving state government officials to get action taken to translate some of the academic findings into administrative actions. The setting of this study was explained by Prof. VS Vyas

who wondered whether there existed a possibility of organizing men and materials in rural areas in different way that the existing arrangements which would enable the majority of rural poor to avail of the goods and services necessary for a decent human existence. Several conflicts inherent in a policy trying to deal with efficiency and effectiveness were listed. For instance, the problems of low population density, poor economic base, higher vulnerability to small changes in income and thus delicate labour and employment interactions might lead to poor capacity utilisation in case of most infrastructural services located in such regions like for example, schools. When capacity utilization became a concern, facilities were located in the better endowed region where a possibility for fuller use existed further distorting the dynamics of opportunity and access.* The low income in dry rural areas was ascribed to the problems of resources, technology, institutional handicaps and absence of external stimuli. The order of priorities in the programmes as well as content of the programme to the rural poor were then analysed in the project.

Prof. Ranjit Gupta, while describing the key physical features and structure of the area, highlighted basically three constraints:

1. The problem of soil erosion linked to soil fertility and topography etc.
2. Long term agm-climatological features, particularly from the point of view of tailoring the agricultural operations with the changing monsoon patterns and
3. The possibility of developing weekly hats, i.e. the markets as growth centres. Further, the problems of physical access were also taken note of.

*Also, see, my paper on 'Transformation of 'Sectors' into 'Access - Space', IIPA, mimeo, 1980.

The key thrust of Prof. TK Moulik's presentation was that the traditional forms of leadership were often not aligned with the modern institutions of authority and functions. The percolation effect may not be very far reaching if the modern political positions did not overlap with the traditional but more respected authority structures. The importance of traditional religious and sociological practices for understanding the rationale of survival mechanisms of poor was also mentioned. Micro level imbalances and inequalities in the resource use ability of tribals in fertile region, vis-a-vis, poor regions were underlined and a caution was suggested that unless a specific policy mix was devised to check the imbalances, the gap between better endowed tribals and the poor endowed tribals might widen with the passage of time. The scattered settlement system was considered as a hindrance to better administrative function and programme reach.

It may be added here that the issues of dispersed human settlement and fragmented holding in dry regions have been looked into by researchers for a long term. However, we believe that social cohesion was inversely proportional to the density of population. Recent studies as a part of action research rural development programme by the Centre (CMA) in Jhabua have hinted at such a possibility.

A need for local planning, was also highlighted. Prof. BM Desai, while discussing the economic structure, elaborately described the agricultural practices and the need for appreciating traditional mechanisms of diversified cropping pattern. One of the very important observations in this section of the report was about the need for considering different

traditional varieties of even major crop like paddy, for the purpose of statistical data collection by government so that one could use this data to understand the likely land use characteristics and region specific constraints. It was regretted that various studies had neglected why the same family, grew more than one variety of crops. Undoubtedly, this was a very crucial and pertinent observation, which was valid even today and was equally significant in terms of its neglect.

The consumption compulsiveness of households in terms of their anxiety to ensure a family's need from own farm instead of market purchases was noted as an important feature of household economy. In this region, given the inadequate and imperfect market network, this was considered as a reasonable strategy. The pooling of labour was also found to be existing as an informal mechanism for performing agricultural operations. The large scale indebtedness led to land alienation in large number of cases. Highly restricted supply of institutional credit was also noted as an important constraint to the development. Despite existence of regulated markets, preference of tribals for private traders was very conspicuous despite the fact that the private traders had unfair weight practices besides high trade margins.

The high dependence on livestock with a very low level of productivity was found to be serious a drain on local resources. Apart from problems of brood, fodder, marketing with respect to livestock, it was also mentioned that the important linkage between the draft power need and the domestic milk consumption had generated a specific type of low productivity-low cost animal management strategies.

The problems regarding forest and other resources use were also mentioned. It was highlighted that the linkage between forest, transport labour mobility, market development, cottage industry etc., need to be developed if stagnancy in the local level of income of the poor were to be removed. The importance of water-shed management besides various other non-formal activities were also listed.

In a separate case study Prof. Desai described the complexity of relationships between credit, product, and labour markets requiring careful study of these linkages before viable interventions could be discovered and made. Likewise, problem of health, education, etc. were also noted.

Lastly, presenting one of the most interesting aspect of dry region administrative structure, Prof. Vyas questioned whether there existed any rationale for dichotomising the regulatory and developmental functions of the government. In a way this was one of the most important lessons of the study because of the continued obsessions amongst the public administration researchers in seeking to distinguish problem of so-called regulatory and developmental administrations. The bureaucratic inertia and indifference it was stressed emerged not due to some notion of objectivity instead as an outcome of the improper appreciation of the regulatory functions in dry region like Dharampur.

In the absence of strong coordinating structures at local levels, in a large taluka like Dharampur (in fact it is the largest taluka of the state), need for innovative administrative structures could not be further emphasised. The problems of structural gaps between interventions at various levels of administration were also highlighted. The ratio of

supervisory staff to the field level staff was found to be very low. In some of the important office like that of tenancy Mamlatdar, the inadequacy of clerical staff was found to be a handicap for the pursuance of further work in that regard.

It was also regretted that most of the voluntary agencies had taken a sort of philanthropic approach to development instead of organising and fighting on behalf of rural poor. Absence of organisations was considered one of the major reasons for inadequate supply of goods and services to poor. The frequent transfers of officers and generally posting of people on punishment, promotion or probation provided a highly disinterested transient bureaucracy which did not identify with the local problems. The rationale for considering posting in such regions as some problem or punishment were listed below:

- a) Because of scattered settlement, it was difficult to show quick results which was a serious disadvantage in the target chasing system of evaluation.
- b) Government did not distinguish the features of one taluka from another, particularly the more developed one and apply the same norms for resource allocation as well as for evaluation of outputs. For instance, the restriction of petrol consumption to Rs.300 per month applied to Gandwi taluka having only 51 villages as against Dharampur which had not only more than four times (237 villages) but also had poorer roads.
- c) Despite differences in the size and ecology of the region, their staffing pattern remained identical to other talukas. This had implications for workload of various functionaries.

- d) Instead of compensating the functionaries in difficult places, they were discriminated against in a number of ways. The travelling allowances at better locations turned out to be much more compared to the poor location likewise the residential accommodation, medical care, and various other facilities were of very low order in such underdeveloped regions.

It was therefore not unexpected that people who came to these regions were neither interested nor most competent to resolve the problem of development. This got reflected in the minds of adivasis (tribals) whose apathy became a logical concomitant to bureaucratic indifference.

In second volume of the study of rural development for rural poor, a sort of action plan, in terms of identifying concrete tasks in the field of economic, health, educational spheres was presented. It was acknowledged that there might be numerous inadequacies in the whole approach for that matter even in the prescriptions. But it was underlined at the same time that these inadequacies were essentially the building blocks for institutionalising local participation in the design of action intervention, their implementation and follow up. It was felt that too sophisticated set of recommendations would assume degree of finality which might subconsciously act as a barrier towards mobilising local wisdom in conceptualising as well as operationalising the development approaches. Apart from highlighting very small gains

accruing to the poor from investment of their labour and resources, the importance of subsistence orientation, low productivity and uncertainty were also important. In a way, it might be interpreted by a less careful reader to signify a sort of ecological deterministic approach. However, it must be added that the role of external interventions, both the way they were made, and the way only some interventions were made and not others, was quite crucial.

Regarding education, it was noted that not only the school had dilapidated buildings, but also the teachers never stayed in the village in which they taught and evinced little interest in teaching. They had made schools as a non-functional, if not dysfunctional institution. It may be added here that many of the findings of this study were widely applicable to other tribal drought prone regions as well. Recent studies by us in Jhabua have also shown that literacy rate over last decade had increased by hardly 2 percent (from 5 to 7 percent) and that too with various endemic problems mentioned in this study existing there. The problem of drop-out, inadequate linkage between education and employment, etc., were also listed. It was mentioned that the modern education should try to transfer the ideas and skills in a way that existing anchors of knowledge/concepts rooted in their traditional systems could be built upon. Apart from reviewing the non-official interventions for development, the study also reviewed the impact of various developmental programmes as well as organisational structure. The problem of low return on investment in these regions

was traced to inadequacies regarding personnel coordination and local participation. Need for collectivisation of poor was underlined. As a part of strategy for rural development several suggestions were made as given below:

- a) Rigorous implementation of legislation, which protect the interest of tribal in connection with land alienation, indebtedness, product marketing and minimum wages.
- b) Strengthening of organisations which dealt with the implementation of these policies.
- c) Setting up of Dharampur Gram Vikas Sangh as a sort of corporate agency to coordinate plan and implement developmental programmes.
- d) Provision of adequate infrastructure mainly power, road communication etc.
- e) Establishing developmental service centres disbursed all over the taluka. Each service centres was to be equipped with a village level worker, talati, teacher, health centre worker cooperative society secretary, postal department functionary etc.

It was also expected that these functionaries would be provided suitable accommodation. Considerable attention was given to connecting various service centres. Marketing and credit facilities, were also expected to be strengthened.

A discriminating strategy for employment for various classes was suggested. The formal and informal aspects of education were

sought to be integrated apart from linking nutrition and health policies. It was hoped that acreage under pulses would improve with the availability of irrigation (numerous studies have however shown the converse to be the case). The improved cattle and poultry were to be distributed for the improvement of existing livestock economy. The organizational framework suggested for development of tribal region of this type essentially implied a highly decentralised federal structure with high degree of participation of poor. It was to work through large number of taluka level advisory committees monitoring the performance of various policies. Mechanisms for iterating the membership were to be built up so that same people did not continue to remain member of these committees. It was also suggested that the non-official bodies like panchayat at taluka level and above should be properly integrated with this development Sangh. Professionals were to be involved in the Sangh to add a scientific touch to the method of planning and implementation.*

Another study in the same series of rural development for rural poor involved study of Deogarh tehsil in Udaipur district. The earlier emphasis on pursuing action research in drought prone backward area was continued as a part of five year programme of action research in rural development. Apart from contributions on resource endowment, social and political structure, economic structure,

*Recent studies on district planning have however raised doubt about the possibility of bringing about any lasting change at local level without influencing the central and state level institutions and policies. There were several other limitations of this concept, though innovative it was.

quality of life, there were important insights provided about the development administration and the directions for further action. The key characteristics of poor households in the region were enumerated by Prof. B.M. Desai in his contribution as follows:

- a) The outmigration was considerably more from the smaller and poorer households which among themselves had higher inequality than the non-migrated households.
- b) The proportion of area under millets and oilseeds was larger on smaller holdings.
- c) Tenancy (about 40%) was widespread and found to be on increase in recent past.
- d) Access to formal credit was extremely restricted and predominant reliance on informal sources of credit was noted.
- e) There was considerable dependence on landlords for employment, credit etc.
- f) Income from livestock was a predominant source of managing essential consumption and largely the poor had sheep apart from other livestock, which also had higher mortality rates.
- g) As far as handicrafts and cottage industries are concerned, there was very little value addition locally and large scale imperfections were seen to be existing. Even though the cooperative credit structure was very weak in general, the loan recovery was high.

It may be added that many of above features were not peculiar to Deogarh and in that sense would typically represent one type of

arid prone region. It may be added that as far as the sheep and wool industry was concerned, the extent of neglect and indifference which official system has shown was considerable. In another study we found in Kutch that despite availability of a local carding machine for wool processing, the same had been out of order for one or the other reason and the raw wool continued to be exported to processing centres in North India. Yarn was reimported from those regions for the purposes of weaving blankets, carpets etc. which were then again taken out for marketing. Therefore, one of the major problems in this regard has been to ensure that value addition took place locally and also that the share of the value addition accrued to the primary producer.

In another interesting chapter of the same report on development administration, several interesting insights have been presented by Prof. Vyas and Mr. Tripathi (1980).

- a) Single most contacted government functionary was patwari.
- b) The importance of doctor and compounder of primary health centre was next followed by VLV and teacher. It was interesting to learn that Khadi Gramodyog Mandal had a very low level of contact with the people and almost had no contact with marginal farmers and landless.

The DPAP primarily was an additional source of funding as noted by Prof. Srivastava also in a separate study on management of drought prone area programme.

There was no coordination noted by the authors (Vyas and Tripathi) among various wings of DPAP and the conflicts between non-official chairman of Taluka Panchayat samiti and the official had become crucial determinant of the way the programme implementation took place. Subsidies framed the key plank for popularising programmes. The traditional dependency relationship amongst various sub-sets of household economy like between the sheep owners and the shearers were found to be crucial and therefore any intervention (technological or administrative) ignoring these relationships was likely to founder.

Marketing of wool, AI for sheep availability of shearing machines etc., were some other dimensions of sheep development where scoped for considerable improvement existed.

The technical, administrative and financial approval of watershed projects involved so much complexity that the concept almost always became a casualty during implementation. Further, the content of developmental programmes almost remained standardised and at times totally indifferent to local conditions. An example was given about a particular maize variety which despite proven inappropriateness for local conditions continued to be pushed by the extension agents.

Prof. Moulik and others, while summarising the direction for further action, underlined the need for reorganising social structure, improving the productivity of animal husbandry, and reorganising the administrative set up. The land reform legislation, it was mentioned if implemented properly could go a long way in

bringing the income disparities.

Few other studies on drought prone areas done by the Centre may also be briefly reviewed. Prof. UK Srivastava in a study on management of drought prone area programme in Jhabua district provided detailed insights on the planning and implementation bottlenecks in the projects with particular emphasis on the irrigation tanks in various blocks. Some of the key findings could be summarised below:

- (a) Despite a sort of matrix organisation for DPAP, the actual working was not different from the traditional way of implementing programmes/projects.
- (b) The resource inventory was not completed before launching the programme.
- (c) Even though, a large part of the district had no scope for minor irrigation or utilisation of surface run off, considerable weightage in the financial allocation was given for irrigation sector.
- (d) On the other hand, activity like animal husbandry, which was one of the most important means of survival for majority of the dry poor farmers was given a very scanty attention.
- (e) There was hardly any effort to prepare a shelf of projects using scientific project planning, selection and implementation criteria.

- (f) There was no mechanism to feed the lessons of the particular project into another. The benefit cost analysis was done in a very slipshod manner.
- (g) Often due to administrative reasons, larger number of projects were submitted than were possible to be covered given the average flow of funds.* The result was thinly spread of resources such that a lot of delays and sub-optimal investment could be noted. A large number of reasons were listed as important for causing delays but an important implication was that cost escalation in the process compounded the problems of delay.

The monitoring and information system was very weak and whenever a senior official came to visit the place, the whole lot of information was recompiled rather than building up on the earlier set of information. Large divergence between actual area and planned area under command at various tanks was found to be a general feature. The impact on beneficiaries was found to be mixed, but in general it was negative. Several recommendations were made regarding organisation of DPAP in the district. Main thrust of the recommendations was towards improvement in the project planning and implementation methodology and practice.

Sambrani and Pichholiya (1977) in a study of employment generation in drought prone district- Panchmahal noted that long

*This was a usual budgetary practice in the country because legislative sanction even for a token amount on a scheme entitled bureaucracy to sanction much larger amounts later without bringing it to legislature.

term solution to the problem of poverty could lie in taking up three activities mainly viz house construction, well digging and soil conservation in the short run. Major lacunae of employment strategies was noted as the excessive emphasise on scarcity relief without building durable assets. In their view, therefore, short term investments in housing, soil conservation, and well digging would provide basis for long term sustainable productive investments.

Mr. Patel in a paper based on Dharampur taluka, discussed various sociological features of poverty and showed that more than 90 per cent of the income was spent on food and other essential consumption items, with only 9 per cent left for tobacco, kerosene, liquor, ceremonies and health etc.

Dr. Pichholiya (1977) suggested an action plan for afforestation in dry regions with specific reference to Panchmahal district and identified various species which could be planted in various types of soils.

Mr. Patel (1976) based on Dharampur taluka discussed the overall economic feature of the region and specifically suggested reorganising the Forest Cooperative Societies using local produce for both training and providing employment for the tribals.

Prof. Desai (1976) in a paper based on formal and informal credit in tribal areas raised two issues:

- 1) Factors considered by the rural borrowers to substitute formal lenders in place of informal lenders in Dharampur.

- 2) What should be the objective and broad content of credit policies of the formal lenders, if we wanted to substitute the informal lenders.

It was mentioned that informal credit suppliers by linking factors and product markets had ingenious flexibility to provide various facilities to borrowers even though as traders they paid 20 to 30 per cent lower prices and as employers offered considerable lower wages. It was also mentioned that the high rate of interest at which farmer borrowed from these source probably justified the argument for raising the rate of interest for formal credit. It need not be mentioned here that if rate of interest had to have relationship with rate of return together with the risks then policy of raising interest rate for dry regions, particularly with the purpose of using this as the only means of making risk-return trade-off was of doubtful utility. Further, many times, the borrowing from informal lenders was not out of choice. Also the practices of formal lenders including the transactions costs made the lending fairly costly. However, some of the other recommendations made by Prof. Desai need to be mentioned here in view of their continued validity:

- a) There was a strong need for linking up credit supply in drought prone tribal regions with the programme of employment generation and creation of marketing network.
- b) Unless and until nexus could be established between consumption and production needs of the poor existing nexus between money lenders and poor could not be snapped. The forest labourers cooperative which could

not link credit, marketing and labour needed to be redesigned.

- c) It was mentioned that since low interest rates affected the profitability of formal lenders, the latter might not have incentives to be efficient and imaginative in administering the credit programme. The problem became further serious with the given uncertainty in the continued supply of subsidised loans with the result the borrowers might like to go to surer sources of credit like money lenders.

It was also mentioned that high rate of interest on savings might lead to mobilisation of local funds which in the absence of such an interest were invested in jewellery, gold etc. Given the rationality of subsistence households to grow early maturity varieties despite lower yield rate, it was expected that an attractive outlet for even temporary savings might lead to better liquidity management.

However, as mentioned earlier, the rate of interest issue was fairly complicated and if there was a case for high rate of interest certainly it was valid for the high growth regions, particularly having cash crops like sugarcane or hybrid cotton etc. In other words, the regions of least risk could have the higher rate of interest. But in the risky regions instead of arguing for higher interest, one could argue for agricultural stabilization fund as suggested by Krishnaswamy (1973 - 1974).

Certain other studies on drought prone area development have looked at on one hand, the performance of programmes like scarcity relief and on the other hand have looked at the viability of various new technological interventions for drought prone regions.

Prof. G.M. Desai and others (1979-1980) looked at the impact of scarcity on farm economy and significance of relief operations.

Some of the main findings were the following:

- a) Among three major kharif crops such as Jowar, Cotton and Bajra, maximum loss occurred in dry bajra.
- b) Maximum loss took place in the form of seed, labour and bullock costs. The prices of Jowar and Bajra increased by 36 to 42 per cent.
- c) Considerable dependence of small farmers on bullock power was mentioned. Interestingly enough, the authors did not find any evidence for presumption of the scarcity jobs by bigger farmers.
- d) The insufficient supply of fodder and water were two other important dimensions of scarcity which need attention.

It may be added here that findings on maximum loss in case of Bajra as well as critical dependence on bullocks in case of small farmers are corroborated by separate study by this reviewer in Ahmednagar (1983) and Mahendragarh (1982 - 1984).

Prof. Tirath Gupta (1983) looked at the economics of trees on marginal agricultural land with special reference to hot arid area of Rajasthan. It was noted that majority of the poor households

had chronic deficit in the budget based on income from crop and livestock. On the basis of experimental data, it was suggested that silvi-pastoral system offered highly attractive annual returns compared to very low return from crops which turned to deficit income if the cost of labour was also included. The income still remained in deficit if income from the existing bushes and trees was also included. It was also found that employment potential of silvi-pastoral system was considerably more, in terms of man-days per hectare per year, than only crops.

Mr. Tripathy (1976) in a study of farm ponds in Churu district in Rajasthan found that they were viable as well as favourable to the household strategies of crop and livestock diversification, besides, afforestation.

Prof. Bapna (1990) in a separate study found a positive supply response in case of traditional agriculture in Rajasthan and felt that price policy could be an effective device for modifying the resource use in the right direction.

Finally one could conclude by saying that research thrust towards finding solution to problem of poor in dry regions has been there at OMA for over a decade now, though, need remained for further intensifying this thrust.

It did not have to be mentioned that increased research resource allocation for studying problems of such regions was all the more urgently warranted due to the national concerns as well as suspected continued deterioration of living conditions of majority of poor in dry areas.

List of References (CMA)

1. Bapna, S.L., "Aggregate Supply Response of Crops in a Developing Region. New Delhi : Sultan Chand & Sons, 1981, 164 pp.
2. Chauhan, K.K.S., Mundle, S. Mohanan, N and Jadhav, D, "Small Farmers Problems and Possibilities of Development (A Study conducted in Sangli District of Maharashtra State) CMA Monograph Series No.34, 1973.
- **3. Chauhan, K.K.S., Agarwal, N.L., "Taxation of Agriculture in India with special reference to Rajasthan" Agriculture and Agro-Industries Journal, Vol.4, April 1972, pps 14-21.
4. Desai, B.M., Gupta Ranjit, Moulik TK and Vyas V.S. "Rural Development for Rural Poor - Dharampur Project, Vol II Contours of Poverty and a Plan for Action CMA Monograph Series No. 63, 1976.
- **5. Desai B.M., "Formal Vis-a-vis Informal Credit Supply Sources in Tribal Areas: A Case of Dharampur Taluka, July 1976, IIM Working Paper No. 127.
6. Desai, B.M., "Formal and Informal Credit Sources in Tribal areas: A Case of Dharampur Taluka (A) & (B), 1978 CMA Case No. 461.
- **7. Desai, D.K., Narayana A.V.S., "Planning and Implementation in Agriculture: Studies on High Yielding Varieties Programme Series" Volume III: Hybrid Maize in Madhya Pradesh. CMA Monograph Series No.5, 1967.
8. Desai, D.K., Patel, D.A., "Planning and Implementation in Agriculture: Studies on High Yielding Varieties Programme Series". Volume IV: Hybrid Bajra in Gujarat State. CMA Monograph Series No.6, 1968.
- **9. Desai, D.K., "Management in Rural Development" New Delhi: Oxford & IBH Publishing Co, 1983, 141 pp.
10. Desai, G.M., Singh Gurdev, Sah D.C., "Impact of Scarcity on Farm Economy and Significance of Relief Operation. CMA Monograph Series No. 84, 1979.
- ** 11. Desai, G.M., et. al. Report of the Working group on Fertilizer distribution System in Gujarat. Ahmedabad. Government of Gujarat. (Agriculture and Forest Department), 1983.
- ** 12. Gaikwad, V.R., Parmar, D.S., Rural Development Administration under Democratic Decentralization. New Delhi Wiley Eastern Ltd., 1980.

- *13. Govindan, A., Pichholiya, K.R., "Pulses: Decline in output Poses a Threat," Economic Times, 14 (352), March 6, 1975, 5.
- *14. Gupta, A.K., District Project Planning Cells: Report on an action Research Project, Part I & II, 1981-82.
- *15. Gupta, A.K., Establishment of Planning cells in Selected DPAP Districts: Report of an action Research Project 1982-83.
- *16. Gupta, A.K., Impoverishment in Drought Prone Regions: A View from within: (Joint field study SDC/NABARD/IRMA) CMA, IIM, Ahmedabad 1983-84.
- *17. Gupta, A.K., Underdevelopment Process: An Action Research Enquiry in a semi-arid region of North India. In L.P. Vidyarthi (ed), Rural Development in South Asia, New Delhi: Concept Publishing Company, 1982, pp 113-130
- *18. Gupta, A.K., Conceptualising Farmers' response to cooperative project implementation in Semi-Arid Region. In J.Meul Meester and M.Levin (eds), Traditional Cooperation and Modern Cooperatives, Amsterdam: Royal Tropical Institute, 1983.
- *19. Gupta, A.K., "Land Reforms: Implications for Migration, Employment and Food," The Economic Times, August 24 & 25 1983.
- *20. Gupta, A.K., "Poverty, Population and IRDP," The Economic Times April 9, 1984.
- *21. Gupta, A.K., "Seasonality, Stratification and staying on process in Semi-Arid Regions", June 1982, IIM Working Paper No. 428.
- *22. Gupta, A.K., "Why Poor People don't cooperate? - A Study of Traditional Forms of Cooperations for Modern Organizations, July 1983, IIM Working Paper No.468.
- *23. Gupta, A.K., "Credit Arrangements for Drought Prone Regions: Policy Prescriptions and Planners' Reaction, September 1983, IIM Working Paper No. 478.
- *24. Gupta, A.K. "Role of Public Enterprises in Backward Regions Generating Peasants' Perspective, June 1984, IIM Working Paper No. 511.
- *25. Gupta, A.K., "Socio-Ecology of Grazing Land Management: Inventory of Issues: Sept. 1984, IIM Working Paper No. 524 p. 16.

- *26. Gupta, A.K., "Socio-Ecology of Land Use Planning in Semi-Arid Regions". Sept 1984, IIM Working Paper No.525 p.33.
- *27. Gupta, A.K., Farmers' Response to Cooperative Project Implementation: Cases in Dairy and Sheep, Pasture Development in Arid Regions - Paper presented at IAUES Symposium on "Traditional Cooperation and Modern Cooperative Enterprises" - April 23-24, 1984 at Amsterdam.
- *28. Gupta, A.K., Viable Projects for Unviable Farmers-An Action Research Enquiry into the structure and Processes of Rural Poverty in Arid Regions. Paper presented in the Symposium on Rural Development in South Asia: IUAES Inter Congress, Amsterdam, 1981.
- *29. Gupta, A.K., "Drought-Deficit-Indebtedness: Deprivational and Developmental Alternatives before small Farmer p.79; 1981 included for discussion in "SFAA" Annual Meet 1982 Symposium; Coping with Scarcity in International Agricultural Development, March 10-14, 1982, Lexington, Kentucky, USA.
- *30. Gupta, Tirath, "Hot Arid Regions: Economics of Energy Plantations, The Economic Times, June 30, 1980
- *31. Gupta, Tirath, "Project for Shift in Land Use in a Hot Arid Area: Ex-Ante Analysis CMA Teaching case No.474.
32. Gupta Tirath, "The Economics of Tree Crops on Marginal Agricultural lands with Special reference to the Hot Arid Region in Rajasthan, India". International Tree Crops Journal, 2 (1983), 155-194, Academic Publishers, Great Britain.
33. Krishnaswamy, M.S., Patel, K.V., "Status of Dryland Agriculture The Economics of Dryland Agriculture in Selected Villages of Bellary and Panchmahals Districts," 1970-71, Volume I, CMA Monograph Series No.39, 1973.
34. Krishnaswamy, M.S., Patel, K.V., "Status of Dryland Agriculture: The Economics of Dryland Agriculture in Selected Villages of Bellary and Panchmahals Districts," 1970-71, Volume II, CMA Monograph Series No.40, 1973.
35. Krishnaswamy, M.S., Patel, K.V., "Managing an Action Programme for Dryland Agriculture." CMA Monograph Series No. 48, 1974.

- ** 36. Krishna, P.V., Singh R.B., "Economics of Hybrid V/s. Local Maize". Eastern Economist, 64 (26) June 27, 1975 pp 1346-48.
37. Moulik, T.K., Vyas, V.S., Gupta Ranjit, Desai, B.M., Tripathi, B.L. Patel, M.S., "Rural Development for Rural Poor: Deogarh's profiles," CMA Monograph Series No. 93, 1982.
- * 38. Mathur, K., Gupta, A.K., Action Research for District Planning, in Action Research for Development, ed. by Kuldeep Mathur and Harsh Sethi, pp 7-21, IIPA, 1983, New Delhi.
- *39. Mathur, K., & Gupta, A.K., "Establishment of Planning cells in Selected DPAP Districts : Report of an action Research Project," New Delhi IIM, 1983.
40. Madappa, P.P., Patel, K.V., Patel, N.T., "Decisions on Pumpsets: A Case study of a Saurashtra Village," Economic and Political Weekly, V.1 Jan 3, 1970 pps 21-25.
41. Patel, S.M., Desai B.M., Madappa, P.P., "Management of Lift Irrigation: Report on a Pilot Research Project in Gujarat, CMA Monograph Series No. 15, 1969.
42. Patel, N.T., Inputs Productivity in Agriculture: (With an emphasis on Irrigation and Farm Size) New Delhi: Oxford & IBH Publishing Co., 1982, 226 pp.
43. Patel, N.T., Patel M.S., "Production Functions for Dry and Irrigated Wheat," Financing Agriculture B (II), July-Sept. 1976, 1703.
44. Patel, M.S., "A Short profile of Poverty in a Tribal Area" Adivasi Gujarat, Vol 1, No. 1, 1978 pp 54-62.
45. Patel M.S., "Tribal Development: A Suggestion, Adivasi Gujarat, Vol 1 No. 1, 1978 pp. 3-6
46. Pichholiya, K.R., "Marwari Migration and Impact on Village Life", The Economic Times, 14 (258), Oct. 1, 1974, 5 & 8.
47. Pichholiya, K.R., "Afforestation in Drought Prone Areas: Eastern Economist: 68 (4), January 28, 1977, pps. 131-132.
- ** 48. Rural Development for Weaker Sections—Seminar Series XII, Seminar Proceedings in Collaboration with Indian Society of Agricultural Economics, Bombay CMA Monograph Series No. 51, 1978.

49. Srivastava, U.K., "Management of Drought Prone Areas Programme: Analysis and Case studies from Jhabua District," OMA Monograph Series No. 71, 1978.
50. Sambrani, S., Pichholiya, K.R., "Planning for Employment-Generation: A Study of Panchmahals," Indian Journal of Labour Economics, Vol XX, No.1-2 April-July 1977, pps. 53-71.
51. Sambrani, S., DPAF in Devegudda, (A) & (B). OMA Teaching Case No. Agco 390 (k) 1977.
- **52. Singh, R.B., Upadhyaya, B.V. "Regional Disparity in the Loan Disbursement of Gujarat State Cooperative Land Development Bank," Land Bank Journal, April-June 1978.
- ** 53. Tripathi, B.L., "The Rural University: The Jawaja Letters 1975-79.
54. Tripathi, B.L., "Drought Prone Area Programme: Viability of Farm Productions, The Economic Times, 16 (280), December 14, 1976 pps 5-8.
55. Tripathi, B.L., Gupta, K.K., "Sheep Breeding: Augmenting Income of Rural Folks, The Economic Times, May 5, 1981 XXI, 60, pps 5-6.
- ** 56. Tripathi, B.L., Regions of Special Concern Drought Prone Areas" OMA Teaching Case No. 447.
57. Vyas, V.S., Moulik, T.K., Desai B.M., Gupta Ranjit, "Rural Development for Rural Poor - Dharampur Project-1, The Setting" OMA Monograph Series No. 62, 1975.
- ** 59. Vyas, V.S., Namboodiri, N.V., "Marginal Farmers: Strategy for Rehabilitation" Commerce Annual Number, March 1980 pp 13-31.

* Not Reviewed

** Could not be found.

The review includes only those OMA studies, other than mine, which were considered relevant for stress prone Semi-Arid economies. Inadvertant exclusions are once again regretted.

Anil K. Gupta

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