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INTEGRATED AREA DEVELOPMENT WITH REFERENCE TO DISTRICT PLANNING

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SUMMARY

During the last Four Five-Year Plans, various development programmes were undertaken for economic, social and cultural development of the country but the rich have become richer and the poor have become poorer because the weaker sections of the community could not derive benefits from the plans due to their limited resources and poor borrowing capacity. The main object of the Integrated Area Development (IAD) Scheme is to improve the economy of the weaker sections of the community in the rural areas. The IAD approach makes possible the integration of objectives, techniques, occupations, beneficiaries, administration, finance and planning. The approach in national extension service and community development block was of multipurpose development when inputs are readily available but in IAD it is an integrated one where the resources and other facilities are limited. The concept of backward area depends upon a number of factors like rainfall, soil type, climate, topography, irrigation, etc., for the development of agriculture while lack of raw material, transport and communication, credit, market facilities are the constraints for the development of industry. Illiteracy, unemployment, lack of population control are the causes adversely affecting the social and cultural educational development of the community at large.

The selection of the backward area and the list of small farmers, marginal farmers and agricultural labourers can be considered and prepared by the District Planning Board, District Co-ordination Committee on the basis of income, landholding and land revenue. The indicators of development may be investigated at the micro level in agriculture, animal husbandry, land development, minor irrigation, social and cultural education, health and rural sanitation, co-operatives, banks, communication and transport, credit and market developments, etc., in the IAD block. The technique of IAD programme is micro level planning and budgeting at the IAD block or even at the village and macro level at the district. Individual production plans from each IAD village, village plans and district plan should be the technique for planning and implementation. To evaluate the IAD Programme, various surveys such as bench-mark survey, socio-economic survey, technical survey and repeat survey at proper times are necessary. For these surveys a planning cell and statistical cell at each district level are to be organized for periodical evaluation of IAD programme.

STRATEGY FOR DEVELOPMENT OF AGRICULTURE IN AHMEDNAGAR DISTRICT: AN INTEGRATED AREA DEVELOPMENT APPROACH

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SUMMARY

The main objective of this paper is to suggest a new strategy for development of agriculture in the Ahmednagar district of Maharashtra State. The district is divided into four natural zones depending on the variations in the soil and rainfall conditions. These are : (a) the hilly zone comprising of Akola taluka situated on the eastern slope of the Western ghats, (b) plateau zone I consisting of Sangamner, Ahmednagar, Parner and part of Shrigonda and Karjat talukas of the district, (c) plateau zone II comprising of Jamkhed, Newasa, Pathardi and Shevgaon talukas of the district, and (d) river bank zone situated on the banks of Pravara, Mula, Godavari and Ghod rivers and comprising of Kopargaon, Shrirampur, Rahuri and part of Shrigonda and Karjat talukas of the district. The development of agriculture in these different zones is characterized by these two natural factors. The areas coming under the hilly zone and plateau zone I are comparatively much backward because of less fertile soils and low and uneven rainfall. The plateau zone II, even though backward has got potentialities for the development of agriculture. The river bank zone represents

developed agriculture with canal irrigation facilities. The strategies suggested in the paper are based on the practical experience gained by the authors. Among various strategies, creation and exploitation of irrigation resource, supply of agricultural inputs, farm economic advisory service for providing know-how of new technology, development of subsidiary enterprises and co-ordination of different activities are the important ones. These strategies are evolved for individual zones taking into consideration the present state of agriculture and peculiarities of natural factors. These strategies may be taken up as an indication of the theoretical framework suitable for integrated area development approach to district planning.

AN INTEGRATED DEVELOPMENT PLANNING FOR A BACKWARD AREA OF A BACKWARD DISTRICT IN BIHAR

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SUMMARY

The problem of backward areas, causing "regional imbalances" in the economy is getting importance these days. As a measure to solve the problems of backward areas, "area based development planning" or "district level planning" has been stressed. The idea of "area development planning" has three important aspects: (a) the identification of backward areas, (b) quantification of the level of backwardness, and (c) possibilities of the development and formulation of planning for the backward areas. The Planning Commission has identified Palamau, Saharsa, Purnea, Santhal Parganas, Darbhanga, Muzaffarpur, Saran, Champaran and Bhagalpure as backward districts in Bihar. The main objective of the paper is to study the level and magnitude of backwardness of Muzaffarpur district with special reference to the extent of backwardness of Musahari a depressed area (development block) of the Muzaffarpur district, to identify the level of backwardness and to ascertain the potential as well as the possibilities of economic development in this area. A plan structure on the basis of the "Master Plan" formulated earlier by the Association of Voluntary Agencies for Rural Development for the economic development of this area (Musahari) has been suggested.

A comparative study of the level of backwardness in Muzaffarpur and other backward districts of North Bihar such as Saran, Champaran, Purnea and Darbhanga has been made on the basis of different indicators of backwardness like density of population, per capita income, extent of literacy, transport and communication facilities and the percentage of net cultivated area to the total area and that of the net irrigated area to the total cultivated area. The per capita income in the district of Muzaffarpur was Rs. 142 while it was Rs. 152 in Saran, Rs. 201 in Champaran and Rs. 217 at the State level. The per capita net cultivated area and irrigation facilities per thousand acres of gross cultivated area have also been very much lower (i.e., 0.36 acre and 3.1 acres respectively) in Muzaffarpur as compared to the respective State average figures of 0.43 acre and 18.6 acres. The length of railway in Muzaffarpur district is 322 kms., in Purnea it is 431 kms., in Darbhanga 292 kms., in Saran 318 kms. and in Champaran only 227 kms. Similarly, per 10,000 population surfaced roads covered 1.77 kms. in Muzaffarpur, 1.58 kms. in Darbhanga, 2.01 kms. in Purnea, 2.02 kms. in Saran and 2·71 kms. (maximum) in Champaran. The above comparative study of the level of backwardness of Muzaffarpur, a marginal district among all the backward districts of Bihar, emphasizes justly the need of development efforts.

Musahari is a "block" of Muzaffarpur district having a population of 1,18,737 situated just 7 miles away from Muzaffarpur town. Sixty per cent of its villages are thickly populated and 81.8 per cent of the total number of families have holdings less than 5 acres. Seventy-two per cent of the total labour of Musahari block is engaged in agriculture (35.1 per cent farmers having land, 37.3 per cent landless agricultural labourers) and the total number of unemployed persons seeking job is 12,237. The standard of living in Musahari block is as low as only 4.7 per cent of the total agricultural labourers and 9.9 per cent of the total small farmers have per capita monthly expenditure of more than Rs. 40.

There is great scope for agricultural development in this area through intensive cultivation, by developing irrigational facilities (only 9 per cent of the total area of the block has got irrigation facilities) and applying new technique of cultivation. Due to greater demand for milk, fish and leather in Muzaffarpur town market, the development of dairy farming, fish farming and establishment of leather house have got wider scope in this area.

As Musahari block is quite nearer to the Muzaffarpur town, the small scale and cottage industries like biscuit industry, leather works, wooden works, oil industry, *beeri* industry, soap industry, brick laying industry and flour mills, etc., also have greater possibilities of development.

Reference may be made to a "Five-Year Master Plan" formulated by AVARD (Association of Voluntary Agencies for Rural Development) for the development of Musahari block. The main objective of the plan are the following :

(a) To boost up the employment opportunities to maintain a minimum desirable standard of living in this area.

(b) To increase the level of actual production by 20 per cent (at the annual rate of 4.9 per cent) by the end of the plan.

(c) To increase the average level of consumption from Rs. 352 in 1970-71 to Rs. 386 (at the 1970-71 prices) by 1974-75.

The total outlay of the plan is Rs. 240 lakhs out of which a sum of Rs. 192 lakhs has been proposed to be spent on agriculture, Rs. 27.67 lakhs on industry and Rs. 20.33 lakhs on village road construction. In agriculture a major amount of Rs. 69.24 lakhs is to be spent on irrigation alone. A major portion of the fund proposed to be spent on agriculture is supposed to be received from the Central and State Governments either on 50 : 50 basis or on 75 : 25 basis. Besides, loans from the apex co-operative banks and Agriculture Departments of the Reserve Bank of India are expected. The outlays on industry and road construction are supposed to be managed either from State/Central Governments in the form of assistance or loan from the voluntary associations and from non-government agencies.

The additional production potential and employment opportunities to be created by the plan investment have been estimated for each sector. In agriculture, the total production level is expected to increase to the tune of Rs. 10396.2 thousands and the number of employment opportunities to 9,780 by the end of the plan period. The production potential and employment opportunities in the industrial field of the block are estimated to rise worth Rs. 756·4 thousand and 1,680 respectively during the whole of the plan period. Besides, 1,760 employment opportunities are expected to be created by the "village road construction programme" by the end of the plan period. The above expected achievements of the plan, if successfully fulfilled, may change the economic outlook of the Musahari block.

An analysis of the Master Plan of Musahari block suggests that area-based planning should be started in the States. The area-based integrated plan must include in itself the survey and preparation of irrigation saturation plans, a plan for intensive development of agriculture, animal husbandry, allied agricultural activities, cottage and rural industries and road construction. To assess the developmental potentials and to provide necessary aid and assistance, a techno-economic survey of the area should also be undertaken.

This further suggests that there is need for strengthening voluntary associations and for providing necessary financial support to them to undertake development works successfully.

INTEGRATED AREA DEVELOPMENT WITH SPECIAL REFERENCE TO MANDLA TRIBAL DISTRICT OF MADHYA PRADESH

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SUMMARY

The main objective of this paper is to make an intensive case study of the tribal district of Mandla in Madhya Pradesh with a view to finding out the feasibility of area planning approach in the light of the existing growth potentialities of supporting services that are available in the growth and service centres of the tribal district. Experience shows that although a region has homogeneous geographical,

economic and physical features, it has certain pockets of areas relatively more backward as compared to the other areas of the same region, due to economic polarisation in the latter. Since the growth poles are generally located in the semi-industrialised areas with market-oriented economies, the market forces under their free play compel to concentrate efforts on such areas where necessary infra-structure has been developed and every factor of production promises highest dividend to its agents. Backward areas can be identified by the following features : (a) physical isolation from the market centres, (b) lack of means of transport and communication, (c) lack of financial institutions, (d) preponderance of labour intensive methods of direct production, (e) under-development of human resources, and (f) large proportion of unexploited resources to the total resource potential (including the vast pressure of under-employment and unemployment in the existing economic set-up). In the area under study, nearly two-thirds of the population are scheduled tribes. Data collected from secondary sources regarding different services help in identifying important centres around which rural life and also the urban life tend to revolve. The supporting services considered for the present study are administration, finance, transport, trade, extension services (daily market, wholesale market and weekly market), postal facilities, education, health, farm input supply services and power-line. The greater is the number of services available in a service centre, the larger would be the points of contacts the centre is supposed to have, for these supporting services create all necessary conditions for development of the under-developed areas. These together lead to concentration of population and it is generally found that the population size has strong positive relationship with the numbers of supporting services. For the purpose of ranking the major service centres, each lower order service is given a weightage of one ; the subsequent higher order services in the same group are given higher weightage, namely, 2, 3. All weightages of the different services are summed up for a settlement to denote its centrality. The method used in this study is the law of retail gravitation which states that two centres attract trade from intermediate places approximately in direct proportion to the sizes of the centres and in inverse proportion to the square of distance from these two centres to the intermediate place. In the study area, three distinct patterns of the zone of influence have emerged according to the availability of supporting services.

Mandla district has 13 tribal development blocks, in addition to three community development blocks, and can be grouped into three development areas, viz., (i) Haveli-Gond tribe area, (ii) Baiga tribe area and (iii) Kole tribe area. The study reveals that Mandla, the important growth and service centre, and headquarter of the district is not centrally located. Therefore all the settlements of the district fail to derive equal service benefits. Haveli-Gond area of the district has outstanding benefit of developed transportation and communication, therefore, most of the big villages are situated in this area only. These big villages have developed good prospects of economic development in future by establishing influential markets for agricultural produce. Processing industries as well as other manufacturing industries are concentrated in Mandla, Bahmni, and Nainpur, all falling in this area. Bamhni and Pindrai villages out do 10 of the 13 tribal development block headquarters in providing larger services. Baiga and Kole tribe development areas are much too backward than Haveli-Gond area, not necessarily because they are poorer but because they have long been neglected. It is possible that if now helped, they may more than justify economically the diversion of resources to their needs. The district development authority must be deeply involved in execution and decision-making regarding the development programmes of these areas. The plan resources must be diverted to Kole and Baiga areas from the Gond area of the district.

INTEGRATED AREA DEVELOPMENT WITH REFERENCE TO DISTRICT PLANNING

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SUMMARY

Planning leads to economic growth and erosion of poverty. Introduction of planning in India whose economy is primarily agricultural, has, however, increased the distortions and inequalities on all economic fronts. In spite of the huge expenditure, the process of agricultural development could not gain momentum. The community development programme and other capital intensive projects failed miserably since hardly 10 per cent (only the top ones) of the labour force could participate in it. The 90 per cent poorer rural folk remained on the poverty line. The richer segment of rural India drew the entire benefit of the massive investment and the smaller and poorer major segment remained untouched. At least 10 crores of people are hanging between life and death. This leads to a change in our approach of planning. GSP must get precedence over mere growth in GNP. For this, along with financial resources, the organizational pattern has to be introduced.

Regional planning alone with an integrated area development at the district level through growth centres can promote balanced regional development. The chief aim of regional development is to increase the total volume of regional economic activity both in the urban and rural areas. Agro-urban centres shall provide for each district opportunities such as new technology, agricultural inputs, marketing facilities, transport facilities and agricultural credit and the means of diffusing knowledge of improved farm practices. Thus every villager would familiarise himself with improved technology and at the same time labour intensive factories could absorb a number of village youths.

The nucleus of this development will be a non-official agency, consisting of selfless leaders of the Gandhian constructive idea, *e.g.*, Sarvodaya workers or philanthropic well-to-do farmers, operating in an autonomous manner in every village with only loose co-ordination at taluka/district levels. It will act as a link between the farmers and various official agencies and perform the task of agricultural extension. The planning of agriculture, *e.g.*, capital and current inputs, land use and water use plan, etc., would be done by the official agencies but the implementation of these plans through the farmers would be the responsibility of this agency. Thus half a million villages can have growth with social justice.

The march of agricultural activities has been pretty slow and agricultural production increased at the average rate of 2.9 per cent per annum in the post-independence though it was ¼ per cent per annum before independence. To attain the minimum necessary overall growth rate of the economy of the order of 6 per cent per annum the agricultural output should grow at the rate of 5 per cent per annum. The so-called Green Revolution was limited to the extent of use of miracle seeds but agencies who have to exploit these have let us down. The main task is to achieve increases not in tens of per cent but in hundreds of per cent and that is what Norman Borlaugh achieved through miracle seeds. Only a small part of the cultivated area (15 per cent) is brought under the miracle seeds and 85 per cent is under the traditional varieties. Indian scientists have not yet discovered the right type of miracle seeds in respect of most crops especially non-food crops. Moreover, for such seeds high doses of fertilizer with good irrigation facilities are needed. Fertilizer production has to be increased stupendously so that agricultural production may be raised to 48 kg. per hectare from the present 16 kg. per hectare. The average all-India productivity works out to Rs. 1,037 per hectare. The average agricultural income per agricultural worker works out to Rs. 1,213. But regional differentials range between Rs. 3,195 for Punjab to Rs. 409 for Nagaland—Punjab gave the highest production during 1952 to 1970 with an annual growth rate of 6.6 per cent with Bihar as the lowest 0.7 per cent. Punjab has hard working and intelligent farming population, consolidation of holding is most successful, irrigation facilities are the best. There is proper motivation. Madhya Pradesh is a backward State having no perceptible green revolution. It suffers from the snags of irrigation and tribal area. Per hectare fertilizer consumption is only 5 kg. though the size of holdings is good yet the endogenous factors at work should be streamlined to form the proper infra-structure, say, irrigation, power, road, health, education, etc., which may be in the crude form in the beginning.

A CRITERION FOR DEFINING AREA FOR AREA DEVELOPMENT PLANNING

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SUMMARY

Economic development of India has been defined as an integral function of development of areas or regions. For determining the areas it is necessary to have homogeneity so far as economic condition or the level of living of the population of that area is concerned. For this purpose it has been assumed that given a definition of poverty line and a per capita expenditure above the poverty line which may be considered as the minimum level of living, a criterion can be obtained on the basis of which the nature of development projects are to the decided. For this purpose for a village the economic need (E) has been defined as the difference between consumption needs required for raising the level of living and the resources available. Thus, $E = C - 0$ where C is the required consumption and 0 is the output. Then 'economic need ration' (η) has been defined as the ratio of the economic needs at the beginning and in the tth year.

Thus,
$$\eta_1 = \frac{E_t}{E_o}, \quad \dots\dots\dots(1)$$

where E_o and E_t are the economic needs at the beginning and in the tth year. Now, if C is the per capita consumption required for attaining the minimum level of living and if A_o and A_t are the area source for the village at the beginning and in tth year and 'Y' be the average yield rate, then

$$\eta = \frac{CP_t - A_t.y}{CP_o - A_{oy}} \quad \dots\dots\dots\dots(2)$$

where P_o and P_t are the population at the two points of time, *i.e.*, in the beginning and tth year respectively.

Relation (2) has been obtained on the assumption that 70 per cent of output is from agriculture in the rural areas.

Thus on simplification, we get
$$\eta = 1 \div r(1 - \beta_2 Y)(1 - \beta_2 Y) \dots\dots(3)$$
where r is the growth rate of population.

Case I : When $\eta_1 < 1$, it will mean that the economic condition of a village has improved during the period of study.

Case II : When $\eta_1 = 1$, it will mean that no change has been there so far as its economic condition is concerned.

Case III : when $\eta_1 > 1$, it will mean that poverty of the population has increased.

Thus for development, area will be defined as contiguous villages which are covered by one of these conditions stated above and towns falling within these areas will form its urban component.

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AN APPROACH TO INTEGRATED AREA DEVELOPMENT IN SFDA DISTRICT PRATAPGARH, U.P.—A CASE STUDY

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SUMMARY

This paper refers to the planning of district Pratapgarh which is a backward district of Uttar Pradesh and where the SFDA (Small Farmers Development Agency) Programme is in progress since July, 1970. Situated in the south-east Uttar Pradesh, Pratapgarh district forms southern part of Faizabad division. The land is gently undulating plain except along the banks of the Ganga and its tributaries in the south-west, and the Sai and its feeder streams in the centre. It is, on the whole, fairly connected with Allahabad, Faizabad, Lucknow, Varanasi and Unnao with State highways. Besides, it has a number of *pacca* and *kacha* roads. Being located at the main route of the Northern Railways, it has all the advantages of developed infra-structural facilities required for its fuller development. It has a number of good markets, many of which are purely of local importance, but a few of them have developed into recognized places of trade and commerce, namely, Pratapgarh, Chilbila, Raniganj Kithola, Lalganj, Kalakankar, Kunda and Patti. There are two cold storages in Pratapgarh town. For the supply of farm inputs like seeds, fertilizers and pesticides, etc., there are 197 sale depots run by the State Department of Agriculture, Co-operative Societies, Agro-Industrial Corporation and private licencees in the district.

The success of the integrated area development largely depends upon the evolution of an improved pattern of growth centres, integrating the urban and the rural area with a view to providing basic economic, social and community facilities within a reasonable distance from the place of living. The locational decisions of growth centres are most important for an accelerated development, because they will be the major determinants of future pattern of growth in the region.

In the first phase of the Integrated Area Development Programme in district Pratapgarh, it is proposed that well developed markets in Pratapgarh, Chilbila, Raniganj Kithola, Lalganj, Kalakankar, Kunda and Patti should be developed as growth centres, in view of their spatial and functional positions and other infra-structural facilities available in these markets. The creation of these growth centres would help in not only avoiding the heavy expenditures otherwise needed in making Pratapgarh more easily accessible to its entire dependent territory, building many approach accesses and link roads, but at the same time it would help in developing Pratapgarh by locating proper facilities in appropriate places. In the second and subsequent phases, the less developed markets which are of local importance such as Laxamanpur, Sangipur, Gaura, Behar, Babaganj, etc., should be located as growth centres.

For the desired nature and speed of economic development, the study area needs urgent and sizable improvement of agriculture, animal husbandry, poultry, fisheries, industries, etc. The strategy in raising the agricultural production is primarily dependent on intensive agriculture. It involves the continued expansion of irrigational facilities, expansion in the supply of fertilizers, plant protection materials, farm machinery and credit; full exploitation of high-yielding varieties and improvement in the storage and agricultural marketing system in the command area. The centres of distribution of farm inputs are not very many and their spatial distribution is not balanced. Hence these services should be made available in the proposed growth centres. A technical cell of agricultural experts and information centre, advising the farmers on the problems relating to agriculture, animal husbandry, poultry and fruit industries, etc., should be established in the growth centres. Quite a number of small-scale industries based on local resources could be profitably started. On the basis of our survey, we have come to the conclusion that there are prospects for expansion in some of the existing industries such as agricultural implement, steel furniture, steel boxes, general engineering workshop, washing soap, wooden furniture, silk, and cold storage. There is good scope for a number of other new industries such as establishment of milk dairy plant, fruit processing industries, and manufacture of consumer and intermediate goods for other industries. The existing functional facilities in the proposed growth centres should be strengthened. Greater emphasis should be given for the development of educational facilities, strengthening of health centres and establishment of sound banking system in the growth centres.

A MULTI-DIMENSIONAL APPROACH TO DEVELOPMENT OF TRIBAL AGRICULTURE IN TARAI REGION OF UTTAR PRADESH

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SUMMARY

In the newly reclaimed areas of Tarai in district Nainital, the refugees from Pakistan, ex-Army men and agricultural graduates took up modern farming and are prospering. But amidst such progressive farms there are pockets inhibited by Tharus and Bhuksas who are believed to have migrated from Rajasthan five centuries ago. They are still following the traditional farming methods. Strategic differences can be seen in the standard of living of these tribals relative to their highly progressive counterparts. Due to entirely different sociological and institutional set-up of these tribal farmers, the development of agriculture is of different dimension. Tribal development schemes sponsored by the Centre generally were not successful. The fruits of green revolution have not reached the tribal farmers in Tarai because no attempt has been made till now to supply the modern agricultural inputs as an integrated package. An attempt has been made in this study to highlight the crucial problems of tribal agricultural complex and suggest ways and means for an integrated multi-dimensional development. The specific objectives of the study were : (1) to examine the existing structure of tribal farms in the context of cropping pattern, yields and capital investment, etc., and (2) to suggest an integrated multi-dimensional area plan for development of tribal agriculture. Data for this study were drawn from three different sources of survey of tribal farms during 1968-69 and 1970-71. Cobb-Douglas production functions of the following form were used for evaluating the economic efficiency :

$$Y = a \; X_1^{b_1} \; X_2^{b_2} \; X_3^{b_3} \; X_4^{b_4} \; X_5^{b_5}$$ where Y is the gross farm income, X_1 = operated area (acres), X_2 = bullock labour (days), X_3 = human labour (days), X_4 = fertilizers and irrigation, X_5 = operating capital.

A comparison of the cropping pattern on the tribal and non-tribal farms revealed that the proportion of high-yielding varieties (HYVs) of paddy and wheat are much lower on the tribal farms than on the non-tribal farms. In almost all crops the average yields were relatively lower on the tribal farms in comparison to the farms of the progressive non-tribals. The tribal farms had 8 per cent of the cropped area under irrigation as against 40 per cent of the cropped area on the non-tribal farms. The expenditure on fertilizer per farm on the tribal farms was estimated at Rs. 145 and the corresponding figure for the non-tribals was Rs. 904. As regards the high-yielding varieties the investigations revealed that in the case of paddy about 4 per cent of the cropped area is sown under the HYVs. The proportion of HYVs for the non-tribal farms was about 29 per cent. Similarly, 3 per cent of the wheat area is sown under the HYVs on the tribal farms as against about 70 per cent by the non-tribal farms. The empirical evidence given in the foregoing analysis reveals that the tribal farms on the whole have adopted very little of the new agricultural innovations. The basic reasons attributed to their non-adoption is their isolated way of life, lack of capital and lack of effort on the part of any developmental agency to make an all-round effort in a systematic and scientific way to make available the new agricultural technology.

The production function analysis for the tribal farms revealed that there are high returns for capital investment in the case of high-yielding varieties, fertilizers and irrigation, etc. Traditional inputs like bullock labour are excessively used. The analysis further indicates that the marginal value product per rupee of factor cost is as high as Rs. 7.67, Rs. 5.36 and Rs. 12.00 (under three different surveys) for fertilizers and capital expenditure suggesting that there is a high potential for investment on the tribal farms for items like fertilizer, high-yielding seeds, etc.

The empirical analysis of the study reveals that an agricultural break-through in the tribal areas through a multi-dimensional area approach is needed where all the necessary agricultural inputs are supplied to farmers in one package. The steps in this direction may be : (1) Rural electrification programme should be initiated to increase irrigation potential of the area. (2) The development of infra-structure like roads, etc. (3) Soil testing of the farms to make a balanced use of fertilizers. (4) Educating the farmers by extension techniques for better agronomic practices, soil and water management practices and planning crop demonstrations of new and improved varieties, etc. (5) Establishment of lending institutions should be mobilized so that the farmers could be given liberal credits for purchase of fertilizer, irrigation equipment, investment in subsidiary occupations like dairy and poultry keeping or cottage industries like bee-keeping. (6) Long range planning for storage, processing (hulling mills for paddy) and marketing of farm produce through agro-industries corporation or through co-operatives. All these activities will have to be co-ordinated and supervised under one agency. It may be the Hill Development Corporation, Tribal Welfare Board or Agricultural University which is already having an expertise in this field.

CONCEPTUAL FRAMEWORK OF A CO-ORDINATED MULTI-DISCIPLINARY AREA APPROACH TO DAIRY DEVELOPMENT

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SUMMARY

India accounts for about one-fourth of the total world cattle population but the per capita milk consumption is barely 5 ounces. The low consumption of milk in India can be attributed to the low productive capacity of Indian milch animals. Nearly two-thirds of our cattle are non-descript with no definite breed characteristics. A substantial proportion of milch animals in the rural and suburban areas are dry. The low percentage of milch animals in milk is primarily due to poor management of animals in respect of nutrition, disease control and hygiene. The buffaloes usually calve only in alternate years and therefore the overall proportion of buffaloes in milk are low. Milk is a highly perishable commodity and therefore it requires very specialised system of marketing, transportation and efficient organization. Thus milk production is a complex operation and milk marketing is more complicated. Milk production therefore requires a long range planning of livestock

production through multi-disciplinary approach like breeding, feeding, fodder development, disease control, etc. The purpose of this paper is to highlight the salient features of an integrated multi-disciplinary area approach to dairy development undertaken by the G. B. Pant University, Pantnagar in collaboration with the Glaxo Laboratories, Aligarh and the Co-operative Milk Union, Aligarh. An attempt has also been made to give empirical evidence of the impact of the integrated approach. The data for this paper were collected from a survey of 64 farms, randomly selected from five villages of one of the centres of the project. The input-output data and cropping pattern with emphasis on fodder crops were collected from the farmers. Besides, data from published reports of the project have also been used. The programme known as Dairy Development Project was started in February, 1969. The activities of the project are undertaken through its main three centres : two of which are located in Aligarh district and one in Bulandshahar district. There are four adjoining villages around the three centres. At every centre there are three extension specialists, *viz.*, one each in animal breeding, disease control and animal nutrition. For the whole project there is one agricultural economist located in one of the centres. The extension specialists are on the University staff but the expenditure towards their salaries and allowances are met by the Glaxo Laboratories and the Co-operative Milk Union. There is a Project Advisory Committee with the Vice-Chanceller as Chairman and whose members are on the University staff. All the activities are directed by this committee and the project co-ordinator is solely responsible to co-ordinate all the activities and implementation of the programmes. Programmes under animal breeding consists of artificial insemination. Semen of exotic bulls like Jersey, Red Dane and Brown Swiss are also used. Other programmes under breeding are pregnancy diagnosis, handling of infertility cases. The disease control specialist devotes his time towards disease control, deworming of animals, castrations and vaccinations against contagious diseases like H.S., Rinderpest, etc. The programme under animal nutrition consists of laying fodder demonstrations of new fodder crops in the area like cow peas, jowar (Rio) and piper sudan, etc. Improved fodder seed is sold to the farmers. Balanced feed is manufactured in the feed plant owned by the Co-operative Milk Union and is sold to the farmers.

The study indicated that the integrated approach of breeding, disease control and nutrition aspects had a positive and tremendous impact. Artificial insemination has become popular. Numerous cases of infertility were handled and cases of pregnancy diagnosis in female buffaloes increased tremendously. Farmers have begun experiencing the advantages of balanced rations and feeds to milch animals. Farmers are growing improved fodder crops. In general, there has been an increase in the proportion of area under fodder crops during the two years when the survey was conducted. Fodder crops like cow peas, lucerne and oats became more popular with the farmers. Milk production increased from 1,183 litres per farm in 1968-69 to 2,176 litres per farm in 1970-71. This is partly due to better animal management practices and partly due to the increase in the number of milch animals. Both these factors can be attributed to the integrated area approach made in the project. The sale of milk to Glaxo also increased more than double thus helping its processing plant. The cost of production of milk decreased during the two years due to balanced feeding and good animal management practices. The net profits per animal showed a significant increase on all categories of farms during the two years of the project period. The input-output ratio increased from 0.92 to 1.32 on some farms. Loans are advanced to farmers for buying high-yielding murrah buffaloes. The loan is repayable through sale of milk to Glaxo Laboratories.

Thus the major conclusions of the study were that the farm enterprises like milk production and marketing which are complex and complicated needs multi-pronged effort to develop and organize on sound footing. Milk production can be augmented by co-ordinated and integrated multi-disciplinary area approach to livestock production such as breeding, disease control, balanced feeding, credit facilities to the farmers and assured marketing facilities. By pressing all these disciplines into service in one package programme a break-through in milk production can be brought about. This study therefore suggests that at other potential milk shed regions, the area approach should be undertaken to achieve higher milk production.

EVALUATION OF I.A.D.P. DISTRICT ALIGARH—AN ECONOMIC ANALYSIS

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SUMMARY

The Intensive Agriculture District Programme (IADP) was introduced in the country for achieving sufficiently high rate of output and income from the farm sector. Because of the importance of the programme, this paper makes an attempt to evaluate the changes brought about by this programme in the level of income, consumption, savings and capital formation in the I.A.D.P. district Aligarh over the five-year period (*i.e.*, from 1966-67 to 1970-71). The findings are based on an intensive enquiry of 140 cultivators selected randomly from the Dhanipur block, district Aligarh. The farmers were selected from five randomly slected villages under five size categories of 0—1.5 hectare, 1.5—3.0 hectares, 3.0—4.5 hectares, 4.5—6.0 hectares and above 6.0 hectares. The design of the study was multistage stratified random sampling and the reference period to which the study related was 1966-67 to 1970-71.

The study pointed out that the farm income which in itself is an indicator of development had shown an increase of 41.96 per cent in 1970-71 over 1966-67. The trend of income growth had shown a decline from 13.55 per cent in 1967-68 to 5.79 per cent in 1970-71. The very small farms (*viz.*, 0—1.5 hectare) recorded the minimum growth rate, (*i.e.* 31.69 per cent) in 1970-71 as compared to the year 1966-67. As regards consumption, which was also considered as a very important factor which exerted greater influence on the level of savings, it increased to the extent of 30.95 per cent during the five-year period. The consumption expenditure showed a gradually decreasing trend. It was also noticed that the consumption growth rate was higher (*i.e.*, 8.86 per cent) in 1968-69 which followed the highest income growth rate (13.55 per cent) in 1967-68.

The linear equation of income and consumption for different size-groups was obtained as under :

0—1.5 hectare

$$y = 1281.88 + 100.08 \text{ X (income)}$$

$$y = 1286.68 + 99.38 \text{ X (consumption)}$$

1.5—3.0 hectares

$$y = 3582.03 + 306.91 \text{ X (income)}$$

$$y = 3414.41 + 152.99 \text{ X (consumption)}$$

3.0—4.5 hectares

$$y = 7477.95 + 911.90 \text{ (income)}$$

$$y = 6133.20 + 315.86 \text{ X (consumption)}$$

4.5—6.0 hectares

$$y = 12231.31 + 1224.87 \text{ X (income)}$$

$$y = 10691.51 + 1078.84 \text{ X (consumption)}$$

6.0 and above hectares

$$y = 18331.87 + 1901.38 \text{ X (income)}$$

$$y = 11046.54 + 1268.65 \text{ X (consumption)}$$

The above equations revealed that there were two distinct groups of consumers and the lowest size group (*viz.*, 0—1.5 hectare) consumed virtually all that they produced. The overall saving for the five-year period for all the size-groups increased to the extent of 83.67 per cent. The higher size farms (which comprised 4.5—6.0 hectares and above 6.0 hectares) registered a marginal increase ranging from 18.70 per cent to 39.93 per cent during the entire period. This was because of already better co-ordination of production resources on these farms in 1966-67 (*i.e.*, the period in which the study was started). Contrary to this, the smaller farms increased their savings by two to three folds in the five-year period. The average rate of capital formation had shown an increase of 48.40 per cent over the five-year period. In general, this increase was more marked on higher farms than on the farms of lower size-groups.

The study concluded that there was an urgent need to arrest the falling rate of income growth, failing which the country's economy will be adversely affected. The fall in income growth was attributed to rising prices of agricultural inputs and slacking market prices of agricultural produce. Therefore, the study has suggested to give reasonable prices to the produce of the farmers and to stabilize the price rise of the agricultural inputs.