PROJECT COMPLETION REPORT

AGRICULTURAL INPUTS PROJECT

FARM MACHINERY

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1967 - 1972

PART I - NARRATIVE REPORT

I. Introduction

Farm machinery has recently joined the list of major inputs utilized by Indian agriculture. The term refers to hand tools; power and bullock-drawn implements; stationary diesel engines and electric motors with pumps, threshers, flour mills, rice mills, etc; and power tillers, agricultural tractors and matching implements. Since 1967, the GOI has given priority attention to expanding production of pumps and tractors while also continuing to develop improved bullock implements. However, mechanization policy is not yet comprehensively defined and continues to be the subject of wide debate.[1/]

Upto 1965, the Government of India through support to research and development, focussed attention on improved bullock implements and simple, hand-tools as the program for development of agricultural machinery. Agricultural engineering as a discipline in agricultural universities was new and staff was limited. The industrial capacity for production of farm machinery

1/ There are many authorities who advocate that mechanization should be severely limited because of the potential to further aggravate the high level of unemployment, while others take the opposite extreme position that a much larger quantity of resources should be invested in machinery in order to adequately increase the production of agriculture.

was neglected under the industrial development policy of the first three Five-Year Plans. A few agricultural development officers in widely scattered blocks distributed some improved, bullock-drawn implements manufactured by local small-scale industry as a Taccavi loan in their community development programs. During this period the farm machinery industry remained a badly neglected part of the agricultural supporting infrastructure.

In general, improved implements were not required in the cultivation of the varieties commonly cultivated in India thru 1965. Further, subsistence farmers did not have ready-cash for investment in tools and equipment. Consequently, most research and development effort was placed upon design of improved implements for fabrication by local artisans generally from wood with very simply formed metal parts. There was little attention given to precise placing of seed, fertilizer and plant protection chemicals, nor with high-capacity harvesting of high yielding crops.

The Government of India licensed some tractor production capacity in the private sector as early as 1960. Pumps, electric motors and diesel engines were also being produced by the private sector in small-scale and medium-scale units. These industries made modest growth, generally progressing more rapidly than tractor producers. However, profit margins were small and these industries did not attract any significant attention.

The change to high yielding varieties established a new trend in mechanization. The greater production of the high yielding varieties increased

the workload on cultivation and also increased the farm incomes. The farmers then required machines, and could pay for them. The impact of high yielding varieties was first noticed in greater demand for irrigation pumps. Demand for threshers quickly followed the introduction of Mexican wheat varieties in Punjab. Tractors were somewhat slower in becoming popular because of the large block investment.

II. Agricultural Inputs Project

In the reorganization of the Ministry of Agriculture in 1966, the Minister of Agriculture, Mr. C. Subramaniam established a new post of Deputy Commissioner (Machinery). His selection for the first incumbent of this position was the Director of the Tractor Testing and Training Station and this appointment signalled a new policy to move boldly and include modern machinery in the farm machinery program. This move was further strengthened in 1968-69 by the establishment of state Agro-Industries Corporations, by major tractor imports and the upgrading of the Commissioner's post to that of Joint Commissioner.

In the Agricultural Inputs Project established to support the new Ministry strategy, provision was made for a farm machinery specialist as well as for continuing the existing technical assistance program in fertilizer production and use, a new program of assistance to the National Seeds Corporation and technical support staff in plant protection. The farm machinery

position was initially programmed as a technical support staff position to review Indian agricultural development needs and define appropriate USAID policies for assisting farm mechanization. From the outset, the Deputy Commissioner (Machinery) informally requested technical assistance in his assignment. A technical assistance request was officially received in USAID in FY 1970. Unfortunately at that time USAID was not then able to fill this request on a full time basis as the agricultural engineer had been promoted to Division Chief and new recruitment was limited by manpower ceiling. However, to a limited extent the Mission provided the requested technical assistance from other personnel.

During the period 1966-69, the GOI priorities and programs for development were defined by Annual Plans. This period was characterized by considerable uncertainty as a result of border troubles with both Pakistan and China in addition to severe famine in 1965-66. During this period the impact of the high yielding varieties, of the intensive district programs and of the input development efforts produced a significant increase in agricultural production. By 1969, India had again established a trend of stabilized growth and the IVth Plan was taken up.

By design the agricultural inputs project was established for institution building with a low-profile and high potential multiplier effect. The strategy of the project was to improve manpower training capabilities particularly in selected industry management positions. In farm machinery development particular attention was also given to developing appropriate

policy and industrial development strategy. This project as described in the PROP did not provide for precise identification and association of project inputs and outputs. During 1970-71, while drafting the Project Logical Framework, outputs were defined somewhat, but no major revision of the project was then attempted, as tentative plans were already laid for 1972-73 revision of the total agricultural inputs project.

A. Ministry of Agriculture

Under the Farm Machinery technical assistance program, the Joint Commissioner (Machinery) in the Ministry of Agriculture was assisted in development of policies and programs. USAID had chosen not to fill the requested technical assistance in training of farm machinery operators and mechanics in the mid 1960's pending a thorough appraisal of the GOI technical assistance needs: including analysis of the basic policy questions of the kinds of machinery appropriate for Indian agriculture and the high yielding varieties, the industrial capability available in the country which might be utilized for production of farm machinery, the organization of machinery distribution systems, and the training of operators and mechanics in suitable programs. As a matter of strategy the USAID chose to hold action in fulfilling the technical assistance request pending the outcome of the above exploration.

In due course the Ministry chose to revise their request for technical assistance and specified a joint need for technical assistance in training and policy assistance on machinery requirements. The Ministry further

stated that the technician's location under the revised program would be New Delhi rather than one of the tractor training stations. This revised request for technical assistance eventually was received by USAID in April 1970.

In January 1970, the Agricultural Engineer (Machinery) was promoted to the position of Chief, Agricultural Services Division. In this capacity he divided his time between the administrative responsibilities as Chief of the Division and the continuation of technical needs expressed by the Ministry of Agriculture and initiated prior to that time.

In April 1971, the Commissioner, Machinery, Government of India accepted a short term assignment in Saudi Arabia. This led to a serious disruption of the machinery development program of the Government of India.

Under this project several major contributions were made. The "List of U.S. Farm Machinery with Potential for Use and Manufacture in India" was prepared to improve the utilization of Indian manufactured tractors by introduction of appropriate U.S. farm machinery technology. A book of "Guidelines For Farm Equipment Dealer Services" was prepared and distributed to all of the franchized dealers of Indian-made tractors. Consultation was regularly held with the directors and teaching staffs at the two Central Government tractor testing and training stations. In addition, there were a large number of consultations and conferences with the staff of the agricultural universities, the agricultural engineers of ICAR and the engineering and management staff of both large-scale and small-scale

manufacturers of farm equipment. These consultations and conferences mainly dealt with two major questions: 1) definition of Indian requirements, and 2) identification of proven, U.S. technology which would be of high benefit.

B. Consultants

A major program in defining the Indian farm machinery requirements and formulating recommendations for industrial development was undertaken by a 5-man consultant team under this project. This team toured extensively in India in their study of Indian requirements. The team conducted a seminar for the benefit of invitees from private industry, State Agro-Industries Corporation, agricultural universities and officers of state and central government. The report of this team includes recommendations on machinery for planting, harvesting and potato cultivation and in addition problems of farm machinery sales and services. The Ministry of Food and Agriculture has distributed the report of this committee to all interested engineers, managers and administrative officers with a recommendation that the comments and suggestions of the team be thoroughly considered in formulating any short-term or medium-term planning.

C. Participants

The participant training program which was developed under this project was focussed primarily on the senior administrative officer as a background for developing government policy. Unfortunately, this program

did not materialize within the time frame of the project. It was eventually terminated after only one officer, Joint Secretary in the Ministry of Agriculture, travelled abroad. Engineers and other personnel of state governments and agricultural universities were nominated for training of specialized problems of farm machinery technology under Ag. Production program and the Ag. Universities Development program in the Office of Agricultural Development.

D. Farm Machinery Picture - 1973

At the present time the Government of India does not have a clear long-term policy for developing a farm machinery industry. The position of Commissioner (Machinery) remains filled by a temporary incumbent as the permanent officer continues on extension of his original assignment abroad. Bold action has also been discouraged by serious questions of the labor displacement and the effects of mechanization in the event it is introduced. The Government of India and agricultural universities are undertaking a number of studies on this question and some clarification is expected within the next year or so. Also, the National Commission on Agriculture is devoting major attention to the policy question of farm mechanization and their report is awaited as an indication of the policy that should be followed in the future.

In these circumstances the Indian farm machinery industry faces rather an uncertain future. The manufacturers are confronted with serious and frequent material shortages, labor unrest, power shortages and other

disruption of production. The official policy to implement more severe a land reform programs announced in 1971 also contributed to hesitancy of farmers to invest in farm machinery.

However, March thru June of 1973 witnessed a major increase in demand of tractors and machines. The tractor manufacturers have all expressed amazement at the development that seemed almost mysterious. With the demand and purchase of large number of tractors demand for implements and pumps also increased. In general the farm machinery industry now looks to the future with a degree of uncertain optimism; uncertain because they are not sure of the factors that worked, but expecting these factors to continue to play a significant role. Most manufacturers and others now anticipate that the farm machinery industry will be a seasonal industry and are planning for a slump in demand in the period August through October, then a repetition of the strong seasonal buying experience in 1973.

These various uncertainties make it impossible for a reliable prediction of long term needs by the Indian farm machinery industry. The U.S. industry does offer equipment of appropriate technology. However, the absence of a policy to establish any significant industrial capacity makes it uncertain to what extent U.S. technology might be introduced. The Indian industry at present is very poorly developed and requires particularly man power resources in categories of field personnel such as sales-men, field service men; categories which will require major training programs.

PART II -- STRUCTURED EVALUATION

I. Project Purposes

Develop within the Ministry of Agriculture the capability to assess farm machinery requirements of new agricultural technology, to develop training programs to fully support appropriate farm mechanization and to develop an industry trade associations.

II. Conditions Expected at the end of the Project

1. Farm machinery industrial growth rate of 20% per year composed of a well-balanced line of machines matched to requirements of Indian farming operations.

2. Annual sales of tractors, power tillers and disc harrows of 68,000; 80,000 and 47,500 units respectively in 1973-74.

3. Machinery cell in the Ministry of Agriculture producing regular statistical information on production and needs for major items of farm machinery.

4. Training capabilities of Central and State governments and the private trade sufficient to supply operators, mechanics and service personnel.

III. Performance Summary (See appendix for detailed evaluation)

	Unsatisfactory 1	2	Satisfactory 3	4	5	Outstanding 6	7
U.S. Action Agent				X			
Cooperating Agency			X				
AID/W				X			
USAID				X			
Participant Training		X					

IV. Progress toward conditions expected at end of the Project

1. The farm machinery industry growth rate dropped off seriously in 1970 and fell further in 1971 with the production of various items ranging from slightly declining to slightly increasing over the production in 1970. The industry however recovered in 1973 and final statistics may indicate 20% growth rate in 1973 over 1972. Throughout the entire period all major items of farm machinery had been following the same general patterns as tractors and irrigation pumps. Progress in development of a full range of farming equipment remains unsatisfactory.

2. Annual sales of tractors in 1973-74 are now expected to reach approximately 1/2 of the projected 68,000 units. The production of power tillers may not even reach 8,000 or 1/10th of earlier target. The problem in establishing the industry seems to be mainly the development of adequate credit programs. Marketing organizations for power tillers are also very weak and have not developed adequate capacity. The production of disc harrows remains seriously below the production target for the simple reason that suitable raw material is not yet available from the Indian steel industry. Adequate disc harrow production capacity has been established and demand remains very strong but the absence of a medium carbon sheet prevents the industry from capitalizing on these assets.

3. The disruption in staffing of the Farm Machinery Cell in the Ministry of Agriculture has interrupted the program for providing statistical information. The Ministry introduced prototype statistical booklet and

had distributed several recommendation papers but has not established services on a regular basis.

4. The GOI is now utilizing the training facilities of the two Tractor Training Stations (Budni and Hissar) for training personnel to staff the Agro-Service Centers. Some training of operators and mechanics continues but major expansion is devoted to the Agro-Service Center programs.

V. Follow-up Action Required

The GOI does not now have a well-defined policy. Consequently technical assistance needs can only be predicted after making assumptions. There are exercises now in process that may define policy and these same exercises may define specific TA needs. The National Commission on Agriculture is most promising, however Ag. Universities research and other studies will also contribute. The probability of a GOI request to U.S. for policy TA is not great as U.S. technology is not considered as appropriate, largely because of the extreme differences in farm size. However, GOI does recognize a high value in U.S. farm machinery and the possibility of some requests, even for policy formulation, continues to exist.

The reports of the NCA and some of the other studies define specific machinery development objectives and these are quite likely to be facilitated by access to U.S. technology. The appropriateness of providing U.S. TA will depend upon evaluation of these proposals

on an individual or collective basis as appropriate in the framework of the AID operations.

Technical assistance in farm machinery can be a part of a larger package in a sector loan industrial or agriculture, a technical assistance project or some other grouping. Suitable adaptation may be required but there is much U.S. technology in design, production, distribution, service and use that should be applied. U.S. experience in organization would greatly benefit the organization of business sales/service enterprises for India. Another area is operator and mechanic training method. There are also possibilities in contractor machinery hiring services, cooperative stores, cooperative farms, etc.

The identification of technical assistance objective and approach will depend upon the outcome of current studies of policy objectives for mechanization of Indian agriculture and for utilization of U.S. technology. At this point there does not appear to be any specific indication of components of the future program.

Appendix I

Performance Analysis

A. U.S. Action Agent: USAID Direct Hire

	Not Applicable	Negative	As Planned	Superior
1. Planning and Management			X	
2. Understanding of Project purpose			X	
3. Relations with host Nationals				X
4. Effective administration of Participants		X		
5. Local staff training and utilization			X	
6. Adherence to Work schedule			X	
7. Candor and utility of required reports			X	
8. Timely recruiting of U.S. personnel			X	
9. Technical qualifications			X	
10. Management of Commodities	X			

The relations between the USAID Agricultural Engineer and the Joint Commissioner (Machinery) were exceptionally good. The programming of one man out of the five man team was a serious loss to accelerating the policy review which the participant training was to contribute.

Appendix I

B. Cooperating Country: Department of Agriculture, GOI

1. Personnel

	Not Applicable	Negative	As Planned	Superior
1. Competence/Continuity of Project leadership		X		
2. Ability to implement project plans		X		
3. Use of project trained manpower			X	
4. Technical skills of project personnel			X	
5. Planning and Management skills			X	
6. Technical man-years available			X	
7. Continuity of staff			X	
8. Willingness to work in rural areas			X	
9. Adequacy of pay and allowances			X	
10. Counterpart acceptance of association with project purpose				X
11. Management of commodities	X			

The counterpart initiated this project. However, he did not continue on the job and the activity stagnated at that point.

Appendix I

2. Other Factors

	Not Applicable	Negative	As Planned	Superior
1. Cooperation within host government			X	
2. Host government cooperation with non-government organizations	X			
3. Availability of reliable data/statistics			X	
4. Adequacy of project funding			X	
5. Legislative changes relative to project	X			
6. Adequacy of project related organization			X	
7. Physical resource Inputs			X	
8. Maintenance of facilities and equipment			X	
9. Political conditions specific to project	X			
10. Resolution of Bureaucratic problems			X	
11. Receptiveness to change			X	
12. Actual dissemination of project benefits				X
13. Intent/capacity to sustain and/or expand project impact after U.S. inputs are terminated		X		

The actual activities undertaken jointly were quickly and widely utilized, however, with the change in personnel such activities quickly diminished.

Appendix I

C. AID/W

	Not Applicable	Negative	As Planned	Superior
1. Provision of personnel			X	
2. Provision of commodities	X			
3. Provision of adequate AID/W Tech Backstop			X	
4. Contract negotiation	X			

D. USAID

	Not Applicable	Negative	As Planned	Superior
1. Responsibilities defined			X	
2. Authorities defined			X	
3. Effective communication with AID			X	
4. Effective communication with other Action Agents	X			
5. Mobilization of Mission Staff			X	
6. Coordination with related projects				X
7. USAID performance per terms of ProAg/Contract/PASA			X	

The relation between this activity and the Agricultural University Development Project as well as the Agriculture Production Project was mutually beneficial.

Appendix I

E. Participant Training

Predeparture

	Not Applicable	Negative	As Planned	Superior
1. English Language Ability			X	
2. Host country funding			X	
3. Orientation			X	
4. Participant Availability		X		
5. Trainee selection		X		

Post Training

1. Relevance of training to Project				X
2. Recognition of degree			X	
3. Appropriate facilities for returned trainee			X	
4. Employment appropriate to project			X	
5. Supervisor receptiveness			X	

The program was very much in line with the PIO/P. However, the GOI only nominated one man and he was not the most important individual for the planned program.