

PHILCUSA-FOA PUMP IRRIGATION PROGRAM IN THE PHILIPPINES

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The pump irrigation program under the Department of Agriculture and Natural Resources is one of the many projects of the PHILCUSA-FOA in the Philippines. The office undertaking the implementation of the program is the Irrigation Service Unit, which was formally organized on October 1, 1952, in accordance with the provisions of the Memorandum of Agreement jointly made in August, 1952, by the Secretary of the Department of Agriculture and Natural Resources, the chief of the Mutual Security Agency (MSA) here and the chairman of the Philippine Council for U. S. Aid (PHILCUSA).

This program extends irrigation facilities through the installation of irrigation pumps, thus providing water to communities of small farmers whose fields depend solely upon rainfall for water supply during the rainy period of the year and are left uncultivated during the dry season. The immediate objective is to bring about increase in the yield of the regular season crop of rice in the irrigated areas, make possible the planting of a second crop during the dry season, and improve general farm practices to raise the level of the farm income and the standard of living of the farmers served.

There are three important fundamental factors to be considered before a pump irrigation system is installed, namely:

1. The people
2. The land
3. The water

(1) The people in the area where the pump irrigation system will be installed, such as the landowners and the farmers or tenants, must show and signify their interest in the irrigation project. They must indicate their desire by filing with the ISU, DANR, the necessary application for the purpose. When the application is approved, they must form an association duly registered with the Securities and Exchange Commission, in order to have a legal personality, thus enabling them to transact business and sign contracts with the Irrigation Service Unit.

(2) The land must at least be 75 hectares contiguous and irrigable once the irrigation water is made available. The soil should be of such texture that it will retain a good part of the water brought up for irrigation. It must be at least level or flat so that the construction of canals and their maintenance will be at the minimum cost. The distance from centers of population and good roads must be such that transportation of fuel for the engine and other necessities will not be prohibitive, thus making the operation, maintenance and administration economical.

(3) The water in the river should be able to supply a minimum of 2,000 gallons of water per minute, without being exhausted during the dry season. It must be free from harmful salts and substances toxic to the crop. The height from the water level to the discharge pipe should not be more than twenty-eight (28) feet.

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If one of these factors is not satisfied we simply disapprove the application and no irrigation pump will be installed. The ISU is at present in a position to investigate and study these factors everytime an application is received from interested parties. We have competent soil technologists to inspect the land and soils; agricultural engineers to see the elements involved in the construction of canals, water duty, and other factors; civil engineers for both designing and specification; and construction engineers to determine the proper designing, installation, and construction of the pump and engine on the site. We guarantee the proper installation and working condition of the project before the system is turned over to the association of landowners and tenants, who will eventually own the whole system. We have set a certain standard for a finished project called PHILCUSA-FOA STANDARD which consists of the following important requirements:

1. Engine and pump foundation should be permanent.
2. Pump and engine should be of correct size and design for the pump site.
3. Protective housing for the engine must be constructed.
4. Irrigable area to be comparable to full pump capacity considering type of soil and water duty.
5. Canals should have hydraulic elements which will minimize initial cost, maintenance cost, erosion and silting.
6. Canal structure should be of permanent nature.

Of the fifty 16-inch and the ten 42-inch pump units, bought under the dollar allocation, here is the score to date: (1) 39 units now in operation (1 came from the former IRPA); (2) 11 units under construction; (3) 11 units to be bid for construction. The rest of the bids will be ready for construction before the end of 1953.

The condition for the operation and maintenance of the project is that the irrigation system shall be operated by the association which shall employ mechanics and watertenders as may be necessary, with the approval of the Administration of the ISU until the unit has been fully paid for. A head mechanic will be assisted by a second mechanic whenever it becomes necessary. There must be several watertenders for a unit and it is advisable to have at least one watertender for every 100 hectares irrigated to insure adequate distribution of water.

To date, farmers' associations operating these pump units report excellent performance of both the engines and pumps. The people can hardly believe that the 16-inch Johnston pumps and 95 HP Cummins engines brought by the American people could deliver so much water sufficient to irrigate 200 hectares. In the words of Mr. Flavio Vasquez, vice president, Vasquez Irrigation Association, Sto. Tomas, Jaen, Nueva Ecija, "During plowing and planting times I let the Cummins engines run 24 hours a day and I have no complaint. They are just perfect."

The people's reaction to having the irrigation water is certainly optimistic. They believe that with the irrigation water during this coming harvest season, they will significantly increase their yield from 50 to 75 per cent or more. The effect of the pump is by now felt in places where farmers and tenants have moved and built their houses in areas covered by the irrigation. The community's morale has increased and the people

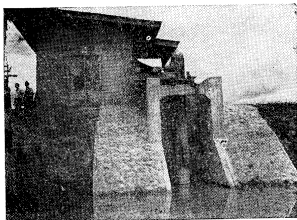
are now busy preparing the seed beds for the coming rice season. With more dollar allocation to buy more pumps and engines, and more peso counterpart to install and manage them, the Philippines will within a few years experience a bountiful harvest of rice in the rice-producing areas.

CONSTRUCTION OF PUMP IRRIGATION SYSTEM*

To be able to appreciate the task of the Irrigation Service Unit in the construction of pump irrigation systems throughout the Islands under the PHILCUSA-FOA program, the reader should know the answer to the question: How does the ISU construct a pump irrigation system?

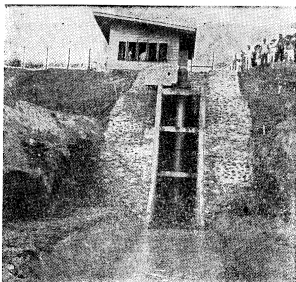
According to the guiding principles jointly approved by FOA, PHILCUSA, and the Department of Agriculture and Natural Resources, a group of landowners with at least 75 hectares of land to be irrigated and with a suitable source of water supply may apply to the ISU (using ISU Form No. 2) for one or more pump units, depending upon the size of the irrigable area.

Upon receipt of the application, the site is investigated by ISU fieldmen and if found feasible, the project is surveyed and designed. The applicants are advised to organize themselves into an association duly registered with the Securities and Exchange Commission. Upon the approval of the plans, construction is undertaken either by the association which spends for the labor with the ISU furnishing all the materials, or by contract whereby the ISU shoulders all the expenses.



A low lift 16-inch pump installed in Sulipan, Apalit, Pampanga to irrigate 200 hectares.

*Excerpt from article by Mr. Pacifico Pinili, Chief Engineer, ISU



A high lift 16-inch pump installed in Magsalisi, Jaen, N.E., to irrigate 200 hectares of riceland.

A pump irrigation project, as constructed by the ISU, must satisfy the following specifications:

1. A pump well and foundation on which the pump is mounted. It is located ordinarily a few meters inside the bank of the river in order to protect it from drifts during floods.
2. Engine foundation on which the engine driving the pump is set.
3. Housing for the engine and the mechanic.
4. Stilling basin to check the high velocity of the water discharged by the pump.
5. Main canal and laterals with the necessary structure to convey the water to the different parts of the irrigable area.

For every 200-hectares irrigable area, 16"-diameter pump and a 65-HP or 95-HP engine (depending upon the lift, that is, the approximate distance from the top of bank to the minimum water level in the river) are installed. For a project of 1,000 hectares, a 42"-diameter pump a 200-HP or 250-HP engine are allocated.

The ISU in one year of existence has been able to complete the construction of 34 projects with 38 16"-diameter and one 42"-diameter pump units installed, and nine other projects (six 16"-diameter and three 42"-diameter pumps), more or less completed.



Irrigation water delivered by a 16-inch pump to irrigate 200 hectares in Sta. Cruz, Laguna.



Main canal and a check gate for a 16-inch pump in Boyaninuan, La Paz, Tarlac.

The main problems or handicaps under which the engineering division of the ISU worked during the first year were:

1. Lack of the necessary technical personnel with sufficient experience in pump irrigation design and construction. Being new the office had to employ mostly inexperienced men in view of the unavailability of experienced ones.

2. Lack of engineering equipment and transportation facilities especially in the provinces.

3. Lack of hydrographic data for almost all sources of water supply. In this connection, it may be suggested that funds to finance the hydrographic survey by the corresponding office of the Bureau of Public Works of all streams in the Philippines for use in the consideration of the construction of pump and gravity irrigation systems be provided.

4. Difficulty in the acquisition of rights-of-way for canals and for pump and engine sites. In most cases small landowners would not part with their lots if traversed by a canal. Likewise some landowners who have not signed the necessary applications but whose lands are within the irrigable area, refuse to give rights-of-way, without certain privileges even if the guiding principles of the ISU require that an application may be approved if signed by the farmers representing at least 3/4 of the area to be irrigated.

5. Difficulty in securing signatures of illiterate small landowners. Many are reluctant to sign the regular application for the installation of a pump for their benefit and also the power of attorney authorizing the ISU to apply for water rights in their behalf for fear that their lands may be forfeited.

The benefits from the construction of 39 pump units by the ISU during its one year of existence will be appreciated when as a result of the operation of these pumps increased yields are obtained by the farmers. By then the ISU shall have justified its establishment.