PN-AAW-403

PAPER No. 20

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C.

EXPERT CONSULTATION ON IRRIGATION WATER CHARGES
FAO, Rome, 22-26 September 1986

M E X I C O

IRRIGATION WATER CHARGES IN MEXICO

by

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Expert Consultation, FAO
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Vocalía Ejecutiva
Secretario Técnico

Septiembre 18, 1986.

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Answers to the Outline for the Preparation of Papers

1. Mexico has under irrigation about 5.6 millon hectares. Irrigation Districts, that are large scale irrigation systems, represent 60% of the total, Irrigation Units or small scale systems account for 32 % and Private Irrigation Schemes take the rest (around 8%). These systems are operated respectively by the state, the direct users and private owners.

Annual harvest of Mexico come from an average area of 18 million hectares. The irrigated sector contributes with about 50% of the Total Value of Agricultural Production. (Appendix).

Irrigated areas are located mainly in the northern and central parts of the country, where climate is mostly arid or semiarid.

Predominant crops in irrigated areas are very similar to those in the national crop pattern, where basic grains and products represent the most part (corn, wheat, beans, rice, soya, sorghum, cotton, sugar cane, saffron, sesame, etc.). (Appendix). They all have guarantee prices that represent, most of the time, a ceiling price for the products. Around 50% of total export value of agricultural products come from irrigated areas. Export goods such as tomatoes, cucumbers, green pepers, etc., are produced mainly in Irrigation Districts located in the north and northwest of Mexico.

The principal type of irrigation in Mexico is by gravity (70%) folowed by deep well pumping (the 30% remaining). Other types of irrigation schemes are just a few and are not significant, like sprinkler and trickle irrigation.

It is estimated that between 1988 and 1990, 8.5 million hectares of total area will be required

under irrigation in order to meet the demand and reach sufficiency in food production. Rehabilitation programs have been a part of investment, aimed to complete works in the systems and to recover past and higher productivity levels; it represents a cheaper unit investment per hectare than new works.

2. Actual policies were established in 1983 in the National Plan for Development: a better equilibrium between the costs of public services and payments made by users. The principles are considered in the principal fiscal laws that apply to water use.

a). In the past, most of the investments in irrigation systems where financed totally by the public sector, except for some rehabilitation works in irrigation districts that were charged to the users. Today, as a product of the search of a better policy, a fair one, more participation of direct users is promoted. The investment side of cost recovery is ruled by the law: "Ley de Contribución de Mejoras por Obras Públicas de Infraestructura Hidráulica" (Law of Contributions for Betterment of Public Works of Hydraulic Infraestructure). (Appendix). It establishes that direct users of new irrigation systems, built up by the state, should cover a contribution of 90% of the recoverable value of the works, in a period of 15 years and with a down payment of 10% of such value the first year. The interest rate for annual payments is determined also through fiscal regulations.

b). Direct subsidies to investment costs vary among type and scale of the systems, the location and the potencial users of the services. Pumped irrigation is not subsidized in irrigation districts, while gravity systems have certain participation of state resources, although it is ruled by the law mentioned already. Irrigation Units, are scattered althrough the country, regardless of the type of irrigation, are subsidized in the investment costs because one of the main objectives of these units is social and local development. Tendency today is to combine federal, state and private resources for the construction of hydraulic works for

irrigation.

c). Public investments include the works needed to convey water and deliver it to the farm. On-farm work can be financed totally by the producer or they may be financed with the aid of a refactionary loan or credit.

d). There are not general indirect methods to finance public irrigation investments other than resources considered in the public budget. Today, it is expected more and more participation of local and state levels in construction works.

e). The recovery of irrigation investments, when it is done by direct means, is regulated by law (Law of Contributions for Betterment). The law also dictates that the resources obtained by this mean, should be again assigned to construction of new irrigation infraestructure, or reinvested in betterment or rehabilitation of existing hydraulic facilities.

f). As every new enforced charge (1986 is the first year that the law is applicable), there is natural resistance to pay from users. This is due to a change in conditions that prevailed for years, where direct recovery was not considered as usual. Also, federal funds for irrigation systems seek to benefit the most of producers and rural families with still no water rights nor land, but taking care of promoting productivity at the same time. Gradually, irrigation works are more expensive as the level of difficulty increases. If prices, economic conditions, devaluation of Mexican peso and deterioration of the already odd equilibium between the agricultural sector and the other sectors, do not help to capitalize the rural sector, effectiveness of investment recovery will be low. In order of realism, present charges or contributions are being revised and adjusted to different payment capacities of farmers.

3. Payments for the abstraction of water are established by another different fiscal law: " Ley Federal de Derechos" (Rights Federal Law). (Appendix). The payment for abstraction is a new

concept in Mexico but is considered as one of the four components of the Price of Water. (Appendix). It was first considered in law by 1982. Annually, it is revised and adjusted to the socio-economic conditions, potencial users and polices regarding the primary sector. Meanwhile the law considers different charges for different regions, water uses and sources of supply (surface and groundwater), for irrigation activities, this component of the price of water was thought uniform for all regions, an equal right per cubic meter,every where, and low, almost symbolic, compared with charges in other uses. It is consistent with the principle that every water user must pay, must contribute for the price of water.

a). For irrigation, is only one charge per cubic meter uniform in the country. For 1985, Congress of the Union determined to exempt irrigation users from this payment. Duration of the regulation and the amount of the charges are annual.

b). Two Federal Secretaries are by law, responsible for the assessment and collection of water charges: Secretaria de Hacienda y Crédito Público (Secretary of Treasury and Public Credit) and, Secretaria de Agricultura y Recursos Hidráulicos (Secretary of Agriculture and Water Resources). They act coordinated and continuously are looking for better, fair and efficient water price schemes.

4. Policies with regard to the financing of irrigation investment in private farms are again consistent with national priorities in which sufficiency in food production is an important objective. In Mexico prevails a regime of mix economy. Public sector supports private investments in irrigation means credit through nationalized banks, low interest rates, tax exemptions and technical assistance, among others mechanisms. The policy is to support private efforts as much as possible and subject to the availability of resources. However, private irrigation schemes are made possible because the use of their own resources.

a). Irrigation systems are public infraestructure that provides farmers with services of water distribution and drainage of excess and return waters. The users own the land as private

producers or, exploit it under the "Ejido" system.

As was mentioned, private irrigation schemes account for an small part of total irrgated area and for national figures their contribution is small. At regional and local levels, importance of private developments migth be relevant, associated with certain crops and usually with agroindustries that process the farm's output, or use it for purposes of cattle raising and dairy production.

b). Policies are, when possible to support with loans at low interest rates, investment decisions of farmers, considering the scarce resources and the net transfer of surplus from the primary sector to the rest of the economy. Private individuals, are private enterprices that look for resources to capitalize their exploilations and make a growing and steady profit from it.

c). From what I know, there is a lack of recent analysis with regard the comparison of public versus private irrigation schemes. By principle, the second schemes are expected to be more efficient and productive, with less operation costs and condition of adequate maintainance of their installations. One most recall that in Mexico there are not public irrigation systems as such, owned, operated and exploited by public personel. The systems were (mostly) constructed by the public sector, but the land and water rights belong to users, to producers registrated in the system.

5. The overall actual policy is that irrigation users must cover the Total Operating and Maintainance costs of the irrigation systems (Appendix). In irrigation districts, the operation and administration of the infraestructure is a responsability of the public sector, directly of the Secretary of Agriculture and Water Resources. This agency collects water charges and apply the resources to cover operation and maintainance costs. The policy and the instruments for the implementation of these waters charges are regulated by law (Rights Federal Law). Small scale irrigation units are under the direct administration of their respective user's associations.

a). O&M costs are generally estimated at a yearly basis according to the accepted crop pattern programed for the agricultural year, which in turn is a function of water availability expectations. The costs include all relevant expenditures for operation, administration, technical assistance and normal conservation or maintainance costs. The predominant method of collection of water charges is advanced payment by users when placing the order for irrigation.

The types of water charges are mainly by volume delivered and by irrigated hectare; amounts vary according to crops, with regard to its profitability, market of consumption and water use, and in some cases the differenciation is due to farm size, type of producer, etc. Government contributes with subsidies mainly to the less developed irrigation districts, those that have the smallest parcels per producer, low value crop patterns and lower technological conditions. The law, Ley Federal de Derechos, determines the level of financial self-sufficiency the districts must reach every year. The percentages are 60, 80, or 100% of O&M cost recovery depending of the size of the district and the average size of farm. Also, the same law considers some adjustments to these levels, and therefore to water charges, according to annual conditions of rainfall, controlled water availabity, plagues, etc. As most cost, irrigation costs are rising when projects become more difficult to built and operate. Cost of dams are included in the investment costs, but their operation and maintainance are considered as O&M costs. In Mexico, income from energy production in hydraulic systems with multiple purposes is separated and directly managed by the Energy Commission, even though some of the common costs are included in the irrigation costs.

b). When economic resources are scarce to cover full O&M costs, budget for maintainace of the infraestructure is reduced and works postponed for times with higher availability of resources. When this situation prevails through the years, the infraestrucrture suffers from deterioration and then programs and new investments for rehabilitation are needed. Actual policies are directed to stop deterioration and gradually recover conservation works differed

in time, with more involvement of direct users and local participation.

c). O&M charges and investment recovery costs are calculated, fixed and collected separately and each is ruled by their respective law: Rights Law for O&M charges, and Law of Contributions for Betterment for investments. National administration in irrigation districts takes care of collection of both charges. The income from O&M charges in used locally to cover recurrent cost for normal O&M. Income from recovery of investment costs should be used for new works, maintainance and repairs of existing hydraulic infraestructure. The funds are allocated to project at the central level when assigning priorities and distributing the budget among proyects, programs, alternatives and regions.

d). Main components of O&M costs are: operation itself, conservation or maintainance and betterment of installations, administration, technical assistance to producers, statistics and research directed to irrigation, drainage and soil use. The first two components, operation and conservation, represent about 80% of total costs and their structure vary depending of the district.

e). Just few irrigation districts have deep well pumping systems; the majority are gravity ones. However, in districts using groundwater, the energy costs as well as capital costs in drilling and equipment for the well, are cover by private owners. Energy tariffs have been steadily increasing over the past few years and represent, for users will deep wells, more than 70% of their costs of managing water to irrigate their cropp.

f). A recent reorganization of the Secretary of Agriculture and Water Resources had been carried out in accordance with national policies. More and more the activities and decision making process to allocate and manage resources for irrigation districts and units, are being transfered from the central to the regional level. The Secretary has Delegates in each state of the country (32) and they have the responsability of looking towards irrigation development. At the central level the following activities are performed: normativity,

analysis and distribution of resources from the budget, and monitoring and evaluation of projects and programs, looking at the consistency with national and sectorial objetives and priorities.

g). The comparisson is difficult because many of the irrigation systems now operating, were built or their construction started more than 40 years ago. Their development was much easier and direct than today's proyects, which are constantly raising their level of difficulty and investment needs. It is expected that projects already built with good designs and correct operation procedures or rules, should have similar O&M costs per irrigated hectare. However, different characteristics of the various irrigation districts and technologies determine the level of O&M costs. Water efficiency in the conveyance and application also affect the unit costs, which are greater for those less efficient in water management districts, and for those having crop patterns with high water consumption per hectare, with second crops in the year or annual crops. National administration do not take energy costs of deep well pumping, and therefore, from this point of view, gravity schemes are for the public sector more costly than others., Gravity systems are capital intensive in their construction with relatively low costs of O&M. Pumping systems are less capital intensive but recquire higher O&M costs.

h). By law and by internal regulations of irrigation districts, users or farmers do participate in O&M decisions through their representatives in the Comitè Directivo (Directive Committee), of the Irrigation District, where public agencies also participate, having in it an important role the Secretary of Agriculture and Water Resources. In small scale irrigation units, because they are managed directly by their users association, farmers participate directly in O&M decisions.

6. The Farmer's Ability to Pay Water Charges varies significantly as a function of: irrigation district, location, technology used, crops produced, efficiency in water use and basically, prices for their products that determine the net rent for their activity. Estimation of this ability to pay of famers confronts some problems. First, the statistics of cost production of crops generally are

associated with prosperous or advanced farmers who are well organized, have accountants and use all inputs needed for better production yields, and therefore have the higher production costs. On the other hand, production values most of times referred to average figures of the system or irrigation unit, instead of those of best farmers from where the costs come from. This led to a general underestimation of the real ability to pay of farmers. In addition, rapid changes in the economic and financial conditions in Mexico, make any analysis obsolete very soon.

However, calculations for years 1976 to 1991 show that this ability is real and positive, since water charges represented averages between 1% to 3% of production value in most cases, for most common crops.

a). Revenues from irrigated crops could generate a profit from 17 to 30% during a growing period of a crop (4 - 6 months), with respect to the costs put in the production. Again these calculations are for past years and today, with interest rates in the Banking System being around 90%, simple annual rate, and more than 140% a year with compound interest, net profit of irrigated agriculture should be revised.

b). Certain public sector industries produce inputs for agricultural production like certified seeds, fertilizers, plaguicides, etc., and are distributed at cost prices or at low cost among farmers, mainly those ejidatorios with less resources available. Commercial and advanced farmers pay full costs and get their inputs out of private bussinesses or even import them, mainly from United States.

c). In regard with tax policies, recent administrations have decided to impose a preferential treatment to farmers producing food and primary goods. Exemptions have been agreed and implemented in taxes for land, production, and even for farmer's income. This tends to offset at a certain point low income coming from low guarantee prices and the net transfer of economic and financial resources from primary to the remaining sectors, industrial and commercial.

d). Water charges have been set considering not to discourge production or affect significantly the net income of farmers. But, at the same time, and these are the central objectives of the Price of Water, (Apperdix) along with the amount of charges, water use efficiency and fair distribution of costs are looked for at the same time. For high value crops, water charges are not significant and in most cases, if not all of them, those charges are not subsidiezed. In low value crops, water charges might indeed affect substantially revenue from the activity, and they have to be considered in setting the amounts and deciding about subsidies.

7. Problems with the collection of water charges are correctly numbered in the outline: updating of charges, because high inflation rates and lack of actual statistics; allocation of available funds that just cover part of what is recquired; the enforcement of water charges that implies human resources, actual files and dynamic control systems, etc. Mexico faces the same problems with different levels of severity among distinct irrigation districts.

As other countries, Mexico supported original irrigation development as a means of colonization, promoting social peace, employment and production of primary goods. One of the problems faced nowdays is the concept that farmers have about water as a common public resource, which is Nation's property and for which there is no price or charge to pay. Eventhough water has no "legal" price, in economic terms it has a price very real that corresponds to the costs for its use, its study, its control and conservation. What water charges are design to cover not the price of water but the costs of the services to deliver irrigation water to farmers and providing adeequate drainage systems. This mentality of farmers have to be changed.

8. Conclusions and Recommendations.

While policies and instruments for their implementation, with regard to water charges are defined and clear, there still is a significant period of time to reach the objetives and hard work and efforts

to do about the subject.

Irrigation costs are increasing in real terms and more rapidly than prices for agricultural commodities. In conditions of scarce financial resources it is needed a greater participation of direct users and farmers in coverage of associated costs of irrigation, in order to operate and maintain conveniently the actual infraestructure and expand it to regions and farmers who do not yet benefit from it.

When setting water irrigation charges, three objectives have to be promoted at the same time: Water Use Efficiency, Sufficiency of Water Costs and Fair Distribution of Costs Among Beneficiaries.

8.1 Main issues about irrigation water pricing

a). Technical, agronomic and economic efficiency of irrigated crops. Production Functions.

b). Calculation of relevant costs for setting Water Charges.

c). Collection instruments. Type, characteristics and effectiveness.

d). Water metering and its relation to water use efficiency and water pricing.

e). Differential water charges by crop, farm size, farmer, region, market of consumption, etc.

f). Financial sufficiency targets of irrigated units or developments.

g). Separatation of costs and benefits with relation to water charge in multipurpose hydraulic systems.

h). Relations of agricultural prices with other sector prices, water charges and federal subsidies.

i). Water pricing in schemes for Humid Tropic Irrigation-drainage developments.

j). Pricing surface water and groundwater; regional conditions, alternative uses and over-exploited acquifers.

k). Selectivity of users and crops for water pricing and efficiency.

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