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Irrigation Management Transfer in Colombia: A Pilot Experiment and its Consequences

by

Carlos Garces-Restrepo and Douglas L. Vermillion

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INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE Colombo, Sri Lanka

#### Irrigation Management Transfer in Colombia: A Pilot Experiment and its Consequences<sup>1</sup>

Carlos Garces-Restrepo and Douglas L. Vermillion<sup>2</sup>

#### INTRODUCTION

Since the 1980's many countries around the world have embarked on policies to transfer management for irrigation systems from government agencies to water users associations, WUAs. (Vermillion, 1992) The most common reason for the policy is the need to reduce government expenditures for recurring costs of resource management by line agencies. There is also a recognition that government agencies have not been very effective in managing irrigation systems according to farmer demands. (Svendsen & Vermillion, forthcoming; Vermillion, 1991) It is assumed that farmers are capable of taking over management and that they also have greater incentive than government agencies to improve cost efficiency and keep their systems financially and physically sustainable. In many cases governments are attempting to transfer irrigation management to farmers who had not previously paid for irrigation services. In these cases transfer means an increase in cost to farmers for irrigation. Most often the initiative for management transfer comes from the government.

In 1976 the Government of Colombia transferred management responsibility for two irrigation districts (Coello and Saldaña) from a government agency to farmer organizations. In contrast to most situations was the fact that farmers were already paying most of the cost of operations and maintenance (O&M) prior to the transfer. In these districts the farmers themselves requested to take over management on the grounds that they had repaid their share of construction costs and could manage the districts more

<sup>1</sup>This study was conducted by the International Irrigation Management Institute with funding from the German Government (BMZ and GTZ).

<sup>2</sup>The authors are an agricultural engineer and rural sociologist, respectively, and are irrigation specialists for the International Irrigation Management Institute. The authors wish to thank Juan Fernandez for his assistance in collecting much of the data for this study; the Instituto Colombiano de Hidrologia, Meteorolgia y Adecuacion de Tierras (HIMAT) for their cooperation and farmers of Coello and Saldaña for their time and insights. cost-efficiently than could the government. This study<sup>3</sup> describes the transfer process and context and examines management performance before and after transfer. Key questions addressed are:

- 1) What aspects of the transfer supported or detracted from the viability of local management? and
- 2) How did management transfer effect the performance of the irrigation system, especially for cost-efficiency and financial sustainability?

#### CONTEXT AND DEVELOPMENT OF THE SYSTEMS

The Coello and Saldaña Irrigation Districts are located in the Tolima Valley in central Colombia. (Figure 1) They are at an elevation of about 350 meters above sea level. Annual rainfall is approximately 1,200 mm per year.

The people of the valley derive their livelihood mostly from agriculture. Cotton was an important crop in the early years of the irrigation systems (1950's and 60's), but it was eventually substituted by rice which became the main irrigated crop by the 1970's. Maize, sorghum, fruit and vegetables are also now grown and irrigated.

The Coello Irrigation District is a river diversion system with an intake design capacity of 28 cubic meters per second  $(m^3/s)$ , located on the Coello River. It has an irrigated area of approximately 25,600 ha, making it one of the largest schemes in the country. It has 1,347 water users with 1,826 holdings. Average farm size is 14 hectares (ha).

The Saldaña Irrigation System is also a river diversion scheme and is located south from the Coello District but taking its water from the Saldaña River. It has an intake design capacity of 30 m<sup>3</sup>/s. Its irrigated area is 14,000 ha, with 1,500 water users having 1,850 holdings. Average farm size is 7.5 ha.

Average landholding sizes have steadily declined over the period before and after management transfer, with more smaller holdings and fewer larger holdings today than before the transfer. In 1968 26.6% of the farms in Coello District were below 5 ha in size. In

<sup>&</sup>lt;sup>3</sup>Field work for this study was carried out in 1993. It involved collection of secondary data, informal group and individual interviews with farmers, district management and board members and agency staff and formal interviews with randomlyselected farmers.

1993 38.5% were below 5 ha. In 1968 14.4% of the farms exceeded 50 ha. In 1993 only 6.4% exceeded 50 ha. (Table 1)

Both systems were originally constructed and managed as a single district. Feasibility studies for the Coello-Saldaña District began in 1943 under the direction of Caja Agraria, a semi-private agency. Construction was completed in 1953, when both systems became operational.

#### TRANSFER POLICY AND PROCESS

In the early 60's the Government of Colombia entrusted the operation and maintenance of its irrigation districts to INCORA, a government land-reform agency. The performance of the agency in irrigation management was modest at best. Water users of the Coello-Saldaña District were not only unhappy with the poor O&M service provided but were also concerned about the high management costs. In the early stages of development in the 1950's more than 90 % of the farmers paid the water fee, but this percentage declined over time due to poor management. Declining fee collections further hindered the ability of the agency to provide effective irrigation service.

As a result the farmers, who had already formed a water users association (WUA), decided at their own initiative in 1975 to make a formal request to the government that management responsibility for the system be transferred to themselves. The WUA argued that the scheme was legally their property. This was argued on the basis that they had already paid the government their due share of capital costs of construction.<sup>4</sup>

As part of a policy to improve the performance of the irrigation districts, in 1976 the government created the Colombian Institute of Hydrology, Meteorology and Land Development,<sup>5</sup> or HIMAT, which had an initial task to turn over the management of the Coello-Saldaña District to two separate water users associations, thus establishing two separate districts, Coello and Saldaña. This was the first case of irrigation management transfer in Colombia and it set a precedence for further transfers later on.

Negotiations for management transfer were completed within a year in 1975 and '76. The WUAs hired their own lawyer to represent them

<sup>&</sup>lt;sup>4</sup>Prior to construction the farmers agreed with the government to repay their share of construction costs within a 20-year period. It was repaid by 1975.

<sup>&</sup>lt;sup>5</sup>Instituto Colombiano de Hidrologia, Meteorologia y Adecuacion de Tierras

in negotiating the terms of the transfer. The main issues to be resolved were the disposition of existing district staff, ownership status of scheme assets and the future degree of control or involvement of HIMAT in the districts. It was finally agreed that some of the existing staff would be retained by the districts and others would be transferred out. Ownership of assets would remain with the government. HIMAT would retain a role of oversight for district management, to ensure that the systems were properly maintained.

The transfer employed a legal rule in the country's constitution referred to as "Delegation of Administration," by which a public good (an irrigation district) could be turned over to a privatesector corporate entity (a WUA) for administration on behalf of the state. The users were then empowered to recruit staff and organize and manage operation and maintenance of the two systems with the proviso that it would be financially self-reliant and government subsidies for O&M would be discontinued.

Since responsibility for the districts was only "delegated," ownership of assets remained with the government. The government argued that under existing laws it could not relinquish ownership of scheme assets. This "delegation of administration" created a continuing labor relations conflict between the districts and the government which resulted in numerous legal debates and proceedings until the 1990's. Labor laws prohibited the firing of existing staff previously hired by the government. This problem became widespread when the government started transferring management to farmer districts throughout the country in 1990. Eventually a new land development law was enacted with the intent to grant full control to the districts to hire and fire personnel as they wish.<sup>6</sup>

After the transfer in 1976, the WUAs for Coello and Saldaña Districts begans to supervise their respective districts through their boards. Each board had, and still has, seven members with fixed quotas for two categories of farmers--four members having farm sizes less than 20 ha and three with farm sizes of more than 20 ha. After transfer each board recruited general managers who were engineers. The districts then became responsible for day-today operation and maintenance of the systems. This included setting and collecting water fees, hiring and firing their own personnel and planning yearly budgets. In practice the government agency (HIMAT) retained considerable influence over the management of the districts. This included providing advice and consent over O&M budgets and work plans, water fee levels and staff disposition. The agency also retained direct management of the diversion weirs and main structures for both systems.

<sup>&</sup>lt;sup>6</sup>Ministry of Agriculture, Government of Colombia, Land Development Law, January 1993.

#### PERSPECTIVES OF FARMERS AND AGENCY STAFF ABOUT THE TRANSFER

The initiative for transfer came from the water users rather than the government. Farmers assessed the implications of transfer and gave their collective approval in general assembly meetings. By the time of transfer farmers were already financing most of the cost of O&M and had the expectation that they would be able to keep the irrigation fees from rising or to even reduce them.

Farmers interviewed for this study had the following main positive perceptions about the transfer: 1) it helped keep irrigation costs down, 2) it improved accountability of staff to the farmers, 3) it improved the timeliness and responsiveness of management decisions and 4) it led to a decrease in political appointments for staff positions. Interviews with WUA board members in both Coello and Saldaña indicated a strong priority for a policy of irrigation cost reduction.

Group interviews with farmers also revealed the widespread perception that water distribution performance, structural maintenance and cost efficiency could have been much more improved had the users had full control over staff disposition and budgets prior to the 1993 Land Development Law. Interestingly however, there is a strong feeling on the part of the users that the agency should not make a total withdrawal and that it should continue providing an advisory and monitoring role in technical and financial planning. Of 20 farmers interviewed in Coello District 16 stated that HIMAT should continue to be involved in administrative oversight and should not withdraw completely. Farmers also had an expectation that the Government would eventually rehabilitate and expand the systems. However, 60% of farmers interviewed expressed the preference that the WUA should own the structures.

Some farmers expressed the view that by taking over the administration of the systems they were providing a service to the nation by diminishing social unrest related to water problems and that therefore the government had some obligation to compensate the WUA for that service.

District managers expressed concern that the strong farmer disposition toward cost reduction was resulting in some decline in service. Senior experienced personnel have been replaced by younger, inexperienced staff; key technical positions have been eliminated or merged and little or no expenditure is being made in training or replacement of structures.

HIMAT staff at the district and higher levels were initially generally resistant to the transfer. They had the perception that jobs would be lost and the role of the agency would diminish in irrigation management, not only in Coello and Saldaña but eventually elsewhere as well. However, the negotiations and some

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political contacts made by farmers eventually resulted in the transfer decision.

Later it became apparent to farmers that HIMAT's role in the districts was more than just "oversight." They saw it as restricting their ability to further reduce staff and budgets, as the WUAs had wanted. Farmers perceived the transfer as being only partial and not enough to give them full control.

#### RESULTS OF THE TRANSFER

#### Staff and organization

One of the more noticeable impacts of the transfer was the significant reduction of personnel. Before transfer, in 1975, the two districts combined had a total of 300 employees. By 1993 the total staff for both districts was 189 (a 37% reduction). (Table 2) Accounting for changes in area irrigated, in 1975 there were 62.3 ha of service area per district staff. By 1993 this had risen to 147 ha per staff. The number of administrative staff remained the same, at 36. Most reductions were made in maintenance and technical support staff. Staff reductions were gradual and occurred mostly through attrition and non-replacements after retirements. This was because of a law making it difficult for managers to fire government employees. The reduction in personnel allowed management to streamline the organizational structure by combining sections and integrating functions. The general manager, who is responsible to the WUA Board, supervises an administrative unit and three technical units--operations, maintenance and technical services.

There is general agreement between users and agency officials that paper work has diminished and administration has become more efficient after transfer, mostly for irrigation scheduling, fee processing and for communications between users and district management.

There has never been a formal evaluation of the performance of the irrigation system. However, there is a monthly monitoring program mostly related to financial matters, including water fee collection and budgetary control. Lately, the agency has realized the importance of regular monitoring and evaluation and is considering establishing such a unit as part of its new regulatory role.

#### Agriculture

After a temporary halt in expansion of irrigated area, which occurred for four years at the time of transfer in 1976, the general trend of expansion resumed until the latter 1980's. (Figure 2) Largely as a result of the introduction of green revolution varieties in the 60's and 70's, average rice yields increased

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dramatically from approximately 2,500 kgs in the mid 1950's to approximately 6,000 kgs in 1976, at the time of transfer. By the 1990's average rice yields were between 6,500 and 7,000 kgs per ha. (Figure 3) Most of the increase occurred before transfer and high levels were sustained, and slightly increased, after transfer.

#### Operations and maintenance

There is no indication that the operation or maintenance of the system improved or deteriorated dramatically as a result of the transfer. In a survey of 20 farmers interviewed in 1993 in Coello District, 16 stated that there had been no change in system management performance after the transfer. Water continues to be delivered without being measured below main canal offtakes. Farmer interviews reported cases of preferential deliveries to larger farmers and head-enders, although this was apparently not very widespread. Figure 4 shows data on total annual water supply for two rice crops in the Coello District. The amount of irrigation water supplied per ha remained about the same between 1978 and 1991, with no apparent improvement in water use efficiency. Relative water supply (i.e., supply/demand) has remained in the range of 2 and 2.5 throughout this period. This indicates a water use efficiency of between 40 and 50%.

Between 60 and 70 percent of all district income goes towards maintenance of the irrigation network. This percentage did not change significantly after transfer, since 05M budgets continued to be based on previous years and continued to be reviewed and approved by the agency. Farmers seem to be equally divided between chose who feel che amount of water delivered to their fields is 'always' (35%), 'me't of the time' (30%) or 'sometimes' (35°)--in accordance with what they were supposed to receive. Several smallholder farmers interviewed noted that some influential "arger farmers, including WUA board members, tend to intervene in day-today management and give orders directly to ditch riders or other field staff, sometimes for partisan purposes. Farmers are also divided in their views as to whether the system is deteriorating. Since the government still claims ownership of system structures, farmers are unwilling to raise a capital replacement fund, although they do have a replacement fund for equipment.

#### Financial management

The Coello and Saldaña districts have both a fixed area water fee and a volumetric water fee. The emphasis by farmers after transfer on cost efficiency has actually resulted in a decline in the area fee since transfer. However there has been an increase in the volumetric water fee, after adjusting for inflation. The area fee has dropped in real terms from about 2,900 pesos in 1976 (at transfer) to about 1,900 pesos in 1992 (after adjusting for inflation. The volumetric fee rose from about 0.42 pesos per cubic meters (M3) in 1976 to 0.54 pesos per M3 in 1992 (in constant 1988 Colombian pesos); (see Figures 8 and 9). 65% of farmers interviewed stated that the water fees were "too high," 35% said they were "about right."

When we combine the area and volumetric fee data on an annual basis we find that the total annual cost of water per ha rose 16.9% from the mid 1950's to the period 1989-92 (from Ps. 8,620 to Ps. 10,080, in constant 1988 pesos; Table 3). However, the cost of production per ha for the main irrigated crop (rice) rose 116% during this period. Therefore the cost of water relative to the cost of rice production fell from 4.4% to 2.4% between these periods.

Figure 5 shows the changing patterns in levels of revenue and expenditures before and after management transfer in Coello District in 1988 Colombian pesos. During the initial stages of scheme development, expenditures exceeded district-level revenues, partially because these were off-set by external subsidies and development assistance. The drop in revenue and expenditures was due to the transition from scheme development to scheme management. After transfer, between 1983 and 1992, except for one year, revenues exceeded expenditure levels, with both showing a modest increase. (Table 4) District revenues increased from about Ps. 9,000 per ha at transfer to Ps. 12,000 per ha. (Figure 5) Main sources of revenue were the volumetric and area water fees. Other revenue sources increased from about 10% to 20% of revenue between 1983 and 1992. (Figure 6) Other sources include rental of farm equipment and district property, technical services, fines against members, sale of materials and charges for transporting equipment and materials.

Maintenance costs (including relevant staff costs) account for about 55% of total expenditures in Coello District (Figure 7). This is followed by costs of administration and operations. General levels of each type have remained the same after transfer.

#### CONCLUSION

#### Viability of local management

The policy of partial farmer repayment of construction costs and enforced payment of seasonal water fees engendered in the farmers enough of a sense of ownership in their systems that they lobbied the government to take over management and obtain real ownership of system assets. The fact that most farmers were paying water fees to cover the main share of O&M costs prior to turnover created a more motivating condition for the farmers to take over management because of the expectation that they could not only improve management but could contain or perhaps reduce the cost of irrigation.

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The half-way response of the government of "delegation of authority" only partially satisfied the farmers' interest in obtaining full local control for system management. In practice it became apparent to farmers that more *responsibility* than *authority* was transferred to the districts. The government retained more of a supervisory than an advisory role over district budgets and O&M plans. The farmers had wanted HIMAT to play more of an advisory role. They were unable to cut staff and costs as much as they wanted. It is apparent that the farmers need and want the agency to continue to provide technical and financial support services. They see a need for HIMAT to act as an auditor and mediator to help legitimize the farmer organizations and settle disputes.

The failure to transfer ownership of system assets to the WUAs, combined with an expectation that the government would make future repairs and replacements, left farmers without a reason to raise a capital replacement fund. Such a fund probably would have considerably strengthened the organizational and financial sustainability of local management under the farmer districts.

Effects on irrigation system performance

After the transfer the farmers' irrigation policy was essentially to contain or reduce costs while maintaining an acceptable level of irrigation service. This was only partially successful. The area water fee declined as did the ratio of the cost of water relative to the cost of crop production. Nevertheless district managers expressed concern that the strong farmer emphasis on cost reduction was compromising the physical sustainability of the systems.

Data indicates that the farmer district, were fiscally responsible in the sense that expenditures never-exceeded revenues after cransfer occurred. Transfer also achieved the government's objective of discontinuing subsidies and making the district financially self-reliant.

Management transfer did not seem to have a pronounced effect on the quality of the irrigation service, although it apparently did not interfere with the farmers' ability to sustain relatively high rice crop yields.

We can hypothesize that a more complete transfer of management authority, and perhaps ownership, would lead to a more favorable result in Coello and Saldaña, but this is not yet tested. With the new Land Development Law and the current program to transfer full management control to farmer districts for all irrigation systems throughout the country, there will soon be plenty of opportunity to examine the results of management transfer nation-wide.

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	19	68	1993		
Farm Size Categories	No. of Farms	% of Total	No. of Farms	% of Total	
0 - 5 ha	264	26.6	703	38.5	
5.1 - 10 ha	200	20.1	386	21.1	
10.1 - 20 ha	207	20.8	300	16.4	
20.1 - 50 ha	180	18.1	322	17.6	
> 50 ha	143	14.4	115	6.4	
Total	994	100%	1,826	100%	

# Table 1.Number of Farms by Size Category in Coello District for<br/>Selected Years.

## Table 2. Staffing Before and After Turnover

Pregram	Pro Turnover (1975) Coello & Saldana	AFTEK TURNOVER (1993)			
	Districts	Coello District	Saldana District	Both	
Administration	36	18	18	36	
Maintenance	161	60	50	110	
Operation	51	19	24	43	
Tech/Hydro./ Credit	52	0*	0*	0*	
Total staff Irrigated Area (ha) No. of ha/staff	300 18,700 62.3	97 15,300 157.7	92 12,500 135.9	189 27,800 147.0	

\* This program is now incorporated within the others.

 Table 3. Cost of Water Relative to Rice Production, Coello District \*

 (In 1988 constant Colombian pesos)

Period	Cost of Water/ha (Col. Pesos)	Cost of Production/ha (Col. Pesos)	Cost of Water/ Cost of Production (%)
1953-58	Ps. 8,620	Ps. 194,812	4.4%
1984-87	Ps. 6,698	Ps. 334,400	2.0%
1989-92	Ps. 10,080	Ps. 421,200	2.4%

(In 1988, 333 Colombian Pesos = US\$ 1.00.)

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# Table 4. Revenues and Expenditures, in Colombian Pesos (Millions),<br/>Coello District, 1983-92\*.

<b>REVENUES</b> (Million Colombian Pesos)			EXPENDITURES (Million Colombian Pesos)						
Year	Fixed Fee	Volumetric Fee	Other	Tota! Revenue	Administration	Operations	Maintenance	Miscell- aneous	Total Expen- ditures
1983	82.0	146.2	23.8	252	42.0	29.1	119.6	20.4	211.1
1984	86.4	138.5	10.1	235	51.1	32.2	140.9	12.7	236.9
1985	97.5	162.1	26.8	286.4	45.8	28.3	138.7	7.2	220
1986	93.6	152.6	38.6	284.3	52.5	27.0	182.4	13.0	274.9
1987	114.1	163.7	34.1	311.9	52.0	31.1	169.9	10.7	263.7
1988	107.6	164.6	39.5	311.7	56.1	28.2	161.6	18.9	264.8
1989	110.0	194.6	46.6	351.2	63.2	29.0	170.9	9.7	273.8
1990	102.0	192.2	59.8	354	75.8	30.0	169.6	25.7	301.1
1991	106.3	165.5	66.1	337.9	68.1	34.9	181.6	31.1	315.7
1992	103.2	173.2	85.5	361.9	64.0	38.9	191.7	23.5	318.1

\* In constant 1988 Colombian pesos, adjusted for intlation. 1988 exchange rate was 333 Colombian pesos per 1 US dollar. April 1994 exchange rate was 820 Colombian perios per 1 US dollar.

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# Figure 2. Irrigated Area Before and After Transfer, Coello District, 1954-92\*



\* Annual sum of two irrigation seasons.

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# Figure 3. Average Rice Yield Before and After Turnover, Coelio and Saldana Districts, 1953-93.



Years



## Figure 4. Total Annual Water Supply for Two Rice Crops, Coello District, 1978-91





## Figure 5. Total Expenditures and Revenues per ha, Coello District - 1955-59, 1983-93\*

\* (In constant 1988 Colombian pesos, adjusted for inflation. 1988 exchange rate was 333 Colombian Pesos per 1 US dollar. In April 1994, exchange rate was 820 Colombian Pesos per 1 US dollar.)





Percentage

\*(In constant 1988 Colombian Pesos)





\*(In constant 1988 Colombian Pesos)

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#### Figure 8. Area-Based Water Fee, Coello District, Coello District, 1967-93 (In 1988 Colombian Pesos)\*



Figure 9. Volumetric Water Fee, Coello District, 1967-93 (In 1998 colombian Pesos)\*



\*(1988 exchange rais was 333 Colombian Peecsper 1 US\$. April 1994 rate was 828 Colombian Peecspe 1 US 5)