# An Institutional Analysis of Ganga - Kalyan Scheme Irrigation Management Transfer (IMT) in South India[1]

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## PREAMBLE

THE TRANSFER OF management function in groundwater irrigation in development schemes in India is not overt like the management transfer in surface water irrigation systems. But if we consider the "turnkey" nature of surface irrigation projects or the lift irrigation schemes in India, the government constructs the reservoir, canal systems and feeder channels and virtually hands over the irrigation system to farmers and even bears the management and O&M charges. In Karnataka State, parallelly there is a groundwater institution called the Ganga-Kalyan Scheme[3] (GKS) which can be compared to the lift irrigation scheme. In the GKS, the government funds to provide groundwater irrigation to the members of the GKS on a "turnkey" basis similar to the lift irrigation scheme and has in addition a welfare objective. The GKS was initiated in 1984-85 primarily to assist groups of small and marginal farmers belonging to "scheduled castes and scheduled tribes" and "other backward communities" (SCs, STs and OBCs) in order to provide them income earning opportunities in agriculture so as to lift them above the poverty line.

In the GKS, the "transfer" of management component from government to farmer organizations is subtle. The objective here is to provide assistance to groups of marginal and small farmers to drill irrigation bore wells, provide submersible pumps and water conveyance structures and leave the management function to the farmer organization. In addition, the scale of irrigation by groundwater in hard rock areas (of South India) is by no means comparable to the investment, the number of farmers and scale of irrigation provided by surface water projects. Hence there is no compelling reason for the government to provide management inputs in GKS. In the GKS, there is need for the farmers to bead together for local management for sharing the lifted groundwater on a sustainable and reasonable use basis as a welfare objective. As in a surface irrigation project, the management of GKS is vital for effective sharing of the resource.

### Principles of the GKS Institution

Under the GKS, the Zilla Parishad (ZP) (district level decentralized institution) with the help of the District Rural Development Society (DRDS) and the Social Welfare Office (SWO), will identify small and marginal farmers who have lands below five acres belonging to the SC, ST and OBC classes[1] and the annual income of individual farmers should not exceed Rs 7,200 (US$227) from all sources. A group of 10 to 20 eligible farmers is chosen in such a way that their land is in a continuous block and the cumulative area to be benefitted is around 10 to 15 acres. The hypothesis for keeping low profiles of members and areas benefitted is to seek constructive cooperation from members for an effective sharing of the precious groundwater resource.

After the identification of beneficiaries, the SWO will motivate the beneficiaries to form a groundwater community irrigation cooperation and register the same (according to the State Cooperative Societies Act). This requires payment of share capital by each member and formation of a set of bye-laws for effective working of the cooperative. The President and Secretary of the cooperative will be elected. The society then approaches the ZP for sanction of funds for drift irrigation well (s), installation of submersible pumps(s), energization and laying distribution outlets and conveyance structures. The ZP for Minor Irrigation (sub-division) with the help of groundwater geologist from the District Department of Mines and Geology will explore the possibility of drilling. About 75 percent of the cost of groundwater development is to be met by ZP funds while the remaining 25 percent is to be lent by any local financial institution to the groundwater irrigation cooperative based on the recommendations of the SWO. The total investment required to provide irrigation per acre basis is around Rs 10,000 (US$315). The ZP with the help of the minor Irrigation (sub-

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[3]This scheme is very similar to the P2AT scheme in Indonesia. See Sam H. Johnson III and Peter Reiss, "Can farmers afford to use the wells after turnover? A study of pump irrigation turnover in Indonesia," Short Report Series on Irrigation Management Transfer No. 1, IIMI, Colombo, April 1993, p.6.

division) will get the irrigation bore well(s) drilled on a "turnkey" basis. The conveyance structures including the distribution points (junctions) are then laid. The whole system is then handed over to the irrigation cooperative for sharing the groundwater resource and managing the well and conveyance structures.

In this note we present a case study of a groundwater irrigation cooperative initiated in 1989 in Bangalore District of Karnataka State, (southern) India in order to learn the process of IMT from the government to the irrigation cooperative, the institutional development in the management process and the economic influence of the irrigation cooperative on the farmer members. The field data from the farmer members of the irrigation cooperative were collected in the months May-June 1994.

## CASE STUDY OF A GROUNDWATER IRRIGATION COOPERATIVE

The groundwater irrigation cooperative considered in this study[2] has 15 members each possessing 2 acres of marginal, uneven land in a continuous tract. The ZP has drilled four bore wells on lands belonging to three farmers members (2 bore wells on one farm, and one bore well each on two farms) and installed submersible irrigation pump sets and energized at a cost of Rs 200,000 (US$6,309). Further, a sum of Rs 78,000 (US$2461) has been spent on laying 2,750 feel length plastic pipes and constructing 11 (cement) distribution points to enable the 15 farmers to get irrigation from the four bore wells. The labor for laying the PVC pipes was provided by the farmers themselves.

### Initiative Provided

For the formation of this cooperative, a few officials of the SWO exhibited a "sense of belonging" with the chosen small and marginal farmers as they were felt promising and strived hard to see that an irrigation cooperative was formed and received 100 percent aid from the government. The President of the Cooperative and the Secretary provided immense cooperation to the officials during the process of well drilling, laying conveyance pipes and distribution points. The Cooperative has five farmers on the Board of Directors including one woman farmer.

### Context

The cooperative is located in Bangalore District receiving an average annual rainfall of around 650 mm. In this district, the proportion of net irrigated area is around 16 percent of which 66 percent is irrigated by groundwater. The major crops grown are (rainfed) Ragi (*Eleucine coracana*) and groundnut and (irrigated) vegetable crops (tomato, cabbage, cauliflower, brinjal, bhendi [lady's finger] and rice).

Tracing lines of history during 1956-57, of the irrigated area, around 50 percent was irrigated by irrigation tanks. This practice was helpful in providing good recharge facility to groundwater. During the nineties, due to increasing groundwater exploitation and decline in the community management of irrigation tanks, the area irrigated by tanks formed just around 25 percent. Further, due to degradation of irrigation tanks, a large proportion of dug wells dried up and groundwater is at present extracted from deeper bore wells. The agriculture credit is provided to farmers through credit cooperatives and commercial banks. The inputs are supplied through a good network of agro services centers and other private agencies. Regulated markets exist for most agriculture and horticultural commodities.

Full private property rights exist for landholdings. Land leasing is banned. The average size of the holding is 1 acre. The average net income per gross irrigated acre is around Rs 5,000 (US$158) since irrigation cost is fully subsidized. If the irrigation cost is imputed, the net income per acre will be Rs 3,000 (US$95). The groundwater rights are not properly defined. But according to the Indian Constitutions, the rights of groundwater are with the overlying land owner. Drinking water tops the priority followed by agriculture and industrial uses. As a policy, in Karnataka, farmers do not have to pay any fee towards electrical energy used for lifting groundwater for irrigation (for pump capacities up to 10 horse power) and hence the marginal cost of electricity to lift groundwater is zero.

### *Whether to Do It or Not*

The GKS IMT is aimed at the welfare of the marginal and small farmers belonging to the poor and weaker sections of the farming community. Until 1992 the Bangalore ZP has undertaken about 30 schemes benefitting 14 farmers per GKS totalling 415 farmers in all. The investment per beneficiary falls with the number of beneficiaries per scheme. For instance, the investment in GKS up to ten beneficiaries is Rs 13,7171 (US$433), for 11 to 20 beneficiaries is Rs 6,263 (US$198) and for 21 to 30 beneficiaries it is Rs 4,490 (US$142). But the degree of cooperation falls with increase in the number of members per scheme.

In a democratic set up, with scarcity of resources and infrastructure facilities, it is difficult to expect successful working of all GKS in a relatively short period time. A majority of the GKSs are ailing from non-cooperation from members.

There are also cases where members have sabotaged irrigation pumps and electricity panel boards and have sold them to private GKS institutions and extending this institutional structure to other agricultural areas. This study presents the case of a successful GKS and the cause of failure of GKSs are discussed so that the preconditions for effective IMP in the case of groundwater can be arrived at.

***Preconditions***

In the present GKS, an official of the SWO who belonged to the same community as that of the farmers spearheaded the initiative to collate farmers, by educating them regarding their economic uplift with "constructive cooperation" in sharing the scarce irrigation water among themselves in manners which benefit the entire irrigation cooperative. Further, due to the good response from the members, the SWO was able to get 100 percent subsidy for the initial establishment cost which worked out to Rs 278,000 (US$8,767). In addition to the SWO, encouragement from the Block Development Office and the Deputy Commissioner was responsible for infusing a "sense of belonging" among the members of the cooperative.

An important condition which led to cooperation in IMT is that all the farmer members are related to one another by blood. The Karnataka Land Reform Rules of 1974 provide for development of groundwater irrigation since there is no ceiling on land holding if the land is irrigated by groundwater, while the ceiling applies only for lands irrigated by surface water. Yet another institutional factor promoting groundwater irrigation is the policy of the Government to supply electricity free of cost for lifting the groundwater from irrigation wells with irrigation pumps up to 10 HP capacity. The pump energization also receives top priority in the Karnataka Electricity Board, if the application is made by a GKS. These are some of the institutional support mechanisms for the development of GKS-linked groundwater irrigation.

***Arrangements and Processes***

In the GKS under study, apart from the President and the Secretary, there are five farmers on the Board of Directors which includes a woman farmer also. The Secretary mentioned that there is no freeriding problem among members. When a pump went out of order an expenditure of around Rs 2,000 (US$63) had to be incurred for repair and all the members contributed equally towards this endeavor irrespective of whether they received or did not receive irrigation water from the well whose pump failed. Even farmers who are not using irrigation water in any season will also contribute towards the common cause. Similarly, when there was a theft of the electrical panel board and the new panel board cost Rs 1,650 (US$52) for replacement, all the members contributed equally to this common cause. On another occasion, the Department of Horticulture distributed coconut seedlings and all the members of the cooperative personally bought the seedlings. All these instances are clear pointers of the sense of belonging to the irrigation cooperative and the understanding that the effective working of the cooperative lies in productive cooperation and not in conflicts. A farmer member was even reacting that the society if permitted, would even be happy to welcome new members since the water yield from the existing four wells can easily be shared with other members also.

The responsibility of irrigating lies with the farmer and he/she has to personally put on the pump of the assigned borewell. In case the pump of the assigned well is not in order, it is the responsibility of the concerned farmer to bring conveyance pipes for transporting water from the nearest borewell. This type of arrangement has become a convention and farmers are committed to these rules and norms. The farmers are also providing watch and ward of the electrical panel board near the borewells on a rotation basis.

***Perspectives***

As mentioned earlier, in the GKS, the "transfer" of the management component from government to farmer organizations is subtle, but considering the "turnkey" provision of water in surface irrigation projects and the "turnkey" provision of water in groundwater irrigation projects like GKS, there is a transfer of resource, infrastructure and management components. Hence the cost of irrigation water prior to and after IMT in the case of GKS can only be estimated by comparing the costs of an individual well owner irrigating X number of acres with the costs of the GKS irrigating the same X number of acres. Obviously there are definite cost reductions in the GKS in the case of repairs to irrigation pumps since the cost is borne by all the members while the entire burden is borne by a single farmer in the case of individual ownership.

The other cost reductions are reflected in the possibilities of time savings through division of activities in the GKS. Some members may look after attending to problems of electricity supply while others may look after pump repairs for instance. In the GKS, there has been scope for learning from experiences of different members as the cost of extension information was relatively less. For instance, one member may attend an agricultural fair and may educate other members of the cooperative with regard to the new techniques of production, processing, etc.

### *Performance Results*

As mentioned earlier, the present GKS was initiated during 1989. The crop pattern and profit obtained per acre on an average by members of GKS in 1993-94 is provided in Table 1. The cropping intensity is 200 percent due to groundwater irrigation through GKS. The farmers are now sowing five crops instead of just one crop earlier to GKS. Their profits per acre have increased from Rs 1,000 (US$32) per acre to Rs 5,250 (US$166) per acre due to GKS. This economic advantage is being reaped by all the members who are able to invest their time and efforts in the GKS farming.

*Table 1. Crop pattern and profits obtained by GKS members.*

| Crop | Area (Acre) | Number of crops per year | Profit per farm per year (Rs) |
|---|---|---|---|
| 1. Paddy | 0.5 | 2 | 2,000 (US$63) |
| 2. Ragi | 1.00 | 1 | 1,500 (US$47) |
| 3. Okra | 0.5 | 2 | 1,400 (US$44) |
| 4. Tomato | 0.25 | 2 | 4,000 (US$126) |
| 5. Ridge Gourd | 0.25 | 2 | 1,600 (US$50) |
| Gross | 4 | | 10,500 (US$331) |

The members mentioned that (even though they belong to the backward sections of the community) their creditworthiness after the advent of GKS has tremendously improved and resulted in flow of borrowed capital for the purchase of milch cows and have further improved their economic well-being. A few members have also built better houses after accumulating good savings from their farm incomes since the advent of GKS in 1989. The investment in community irrigation has also helped some members in procuring consumer durables and other capital assets. The major benefit of IMT in GKS has been the provision of good security. The farmers who were earlier raising only one crop of rabi (a major food crop) during monsoon growing about 8 quintals from 2 acres are now able to raise 12 quintals from just one acre, and in addition produce rice.

The reliability of irrigation service in groundwater depends upon uniformity in the supply of electricity. Nevertheless, given the electricity supply, the GKS has been able to strive towards good system maintenance by promptly attending to repairs and restoring the supply of irrigation water to members. The cost of O&M is now transferred from the government completely to the GKS as the members themselves share the costs of pump repairs, electricity panel boards and other O&M charges. Since the government fully subsidizes the cost of electricity to lift groundwater for irrigation, the marginal cost of electricity is zero before or after IMT.

The members of GKS have properly maintained the irrigation structures and have even taken care of their watch and ward operations during the nights, whenever there are threats or thefts. The marginal farmers have greatly benefitted by the present GKS and it is desirable for other GKSs to learn from the responsibilities undertaken by the members for system improvement.

### *Agency Reorientation*

The GKS program began a decade ago in 1984-85. Hence it is necessary to take stock of factors which promote and which deter the effective functioning of the institution. The above case study presents the experience of an effective GKS from which it would be rather difficult to draw conclusions on the proper agency reorientation. For instance, at present the GKS initiation and management transfer lie with the district level decentralized institution the ZP. In some GKS, the ZP minor irrigation officials, for instance, have differences of opinions regarding the assistance they need to render for effective functioning of GKS. This experience may not hold good in other GKS. A few points however may be worth noting for improving the GKS institution:

1. The number of members should preferably be around 15.

2. By and large there should be uniformity in the holding sizes of members of GKS to prevent the exploitation of the small holders by the relatively large holders.

3. Wherever possible the members of GKS should be chosen in such a way that they belong to a homogenous community.

4. The location of the cistern should be at a proper place to ensure proper flow of water to fields of all the members.

## End Notes

1.Karnataka Government Order No. SWL/25/SIP/84 dated 21/11/1984 and Karnataka Government Order No. SEL/226/SLP/87 dated 8/6/1988.

2.Sri Anjayenaswamy Community (Groundwater) Irrigation Agriculture Cooperative Society Limited, Kodigehalli Colony, Bangalore North Taluk, Bangalore 560092. The names of the farmers and office bearers with their size of farm and details of irrigation wells are as under:

| Name of the Farmer | Farm Size (acres) | Number of Wells | Well Depth | Yield of Well (Gallons per hour) |
|---|---|---|---|---|
| 1. Mr. Hanumantharayappa* | 2 | 1 | 105 | 2500 |
| 2. Mr. Hanumaiah** | 2 | 1 | 160 | 4000 |
| 3. Mr. Narayanappa*** | 2 | | | |
| 4. Mrs. Hanumakka | 2 | | | |
| 5. Mrs. Thimmakka | 2 | | | |
| 6. Mr. Motagalappa | 2 | | | |
| 7. Mr. Gangaiah | 2.55 | | | |
| 8. Mr. Kempaiah | 2 | | | |
| 8. Mr. Narasaiah | 2 | | | |
| 10. Mr. Thimmaiah | 2 | | | |
| 11. Mr. Venkataramanappa | 2 | | | |
| 12. Mr. Venkartaswamaiah | 2 | | | |
| 13. Mrs. Rangamma | 2 | 1 | 165 | 3500 |
| 14. Mr. Galappa | 2 | | | |
| 15. Mr. Venkatappa*** | 2 | 1 | 150 | 5000 |

* President of the GKS Irrigation Cooperative
** Secretary of the GKS Irrigation Cooperative
*** Have capacity to attend to minor electrical repairs