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Water Resource Management and Socio-Cultural Adaptations in a River Island Community

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ABSTRACT This paper attempts at understanding the changes in water resource management practices and the related socio-cultural adaptations in a river island community, consequent to the introduction of an agricultural innovation. It is observed that the changed scenario has necessitated new relatationships and cooperation across the castes.

INTRODUCTION

The role of environmental factors in the evolution of human society is significant apart from that of the socio-cultural and intellectual potentials. Land being an important natural resource for human survival its physical and chemical conditions and availability of irrigation facilities largely account for its productivity. As such the effective utilization of land for food production depends even upon irrigation practices which in turn have socio-cultural ramifications.

Anthropological research in understanding irrigation practices and the corresponding organizational adaptations has yielded valuable theoretical insights (Childe 1954; Steward 1955; wolf and Angel 1955; wittfogel 1957; and Leach 1961). Hunt and Hunt (1976) emphasize that irrigation agriculture is a very unusual resource, that it almost has systematic relationships to other features of social organization. Leach (1961) based on his Pul Eliya village study has observed that irrigation is the most significant factor in social organization, in the recognition of kinship, in the formation of marriage alliances, in the distribution of political power and in relationships with the outside world. Millon (1962) has drawn the implicit relationship between irrigation and political process leading to changes in social structure.

The extension of water resources for irrigation has tremendously modified the very agricultural system bringing about a number of changes and reorganizations in the societies concerned apart from resulting in economic affluence. The body of knowledge acquired by a group or society to harness natural resources in its habitat is termed variously as native knowledge, folk knowledge, traditional knowledge etc. Traditional knowledge systems are built on arrangements, juxtapositions and interactions between one form of life or life giving elements and another including plants, animals, water, earth and others among themselves and with human beings (Mathur 1996). The inherent inadequacies and limitations of this system of knowledge are overcome by belief systems and propitiation of supernatural. Whenever a new innovation is introduced either from within or from outside it has a significant impact on the existing system effecting change in the society and altering the body of knowledge.

This paper attempts at understanding the changes in water resource management practices for agriculture and the related socio-cultural adaptations in a river island community, consequent to the introduction of an agricultural innovation. It is also intended to add a note on the present status of the traditional irrigation practices.

THE ISLAND

The study is conducted on Ayodhya Lanka one of the channel islands of Vasista Godavari River. The river islands and the land mass falling within the flood banks are popularly called '*Lanka*' in the local parlance. Ayodhya Lanka is panchayati village forming part of Achanta mandal of west Godavari District. The island is about 30 km. away from where the river confluence with the Bay of Bengal. This proximity of the island to estuary pollute the water around the island with high concentrations of salt especially in dry season making it unpalatable. Apart from the

perennial river water the island is endowed with fertile alluvial soil and is exposed to periodic sea breeze and tidal effect every day.

Ayodhya Lanka is a small island of about 4.62 sq.km. in area. The cultivable land of the island is classified into two types-the *jiraithi* land and the *lanka* land. The *jiraithi* land is the centrally located portion of the island with black alluvial soil enriched by siltation and humus, and is mostly owned by the kapu and a few absentee kshatriya land lords. The *jiraithi* land is surrounded by the *lanka* land which is larger in area compared to the *jiraithi*. The *lanka* land is equally fertile with good deposits of silt. Due to high concentration of sand *lanka* land is loose with high permeability. The *lanka* land is owned but not equally by all the agricultural castes of the island viz- kapu, settibalija and mala. Till recently the farmers were not given title deeds on these *lanka* lands.

Water Resources

The two important water resources on the island are river water and ground water. As Godavari is perennial river, water is available around the island throughout the year. Due to its closeness to sea as already mentioned, the brackish water is pushed into upstream whenever there is tide thus rendering the soft water around the island saline. The levels of salinity rises remarkably during dry season as the flow of fresh water from upstream is almost negligible.

Ground water is the other important water source for the islanders. In spite of water available round the island, the ground water at most of the locations on the island is having varying concentrations of salinity. It is found that at many places the ground water is not palatable and is not even fit for cleaning clothes or bathing. Only at certain locations the ground water is soft and usable for domestic and irrigation purposes. It may be presumed that there is much diversity in under ground water currents, because the adjacent water points greatly differs-one palatable and the other unpalatable. The islanders as part of their traditional knowledge have not recognized land marks to identify possible locations of good water for sinking wells. Since only at a few points good and consumable water is found, the islanders face water problems for domestic and irrigation needs.

Management of Water Resources

Inspite of surplus water found around and within the island (river and ground water respectively) the islanders still depend upon the rain water for irrigation purpose. The cultivable land of the island and water border in the river are widely separated by stretches of sand to use it for irrigation. In addition there is no required technological know how to draw the river water profitably for irrigation. Moreover the application of modern technology to draw river water may prove to be unprofitable. As the sea water constantly enters into the river the salt accumulation increases gradually and reach a state of bitter salty *kasalu* during the summer. And it is in this season there is demand for irrigation water on the island. While, during rest of the year the river water remains moderate and usable due to a steady inflow of fresh water from the upstream. But during this season virtually there is no need of irrigation because the rain water and soil moisture are sufficient for the type of crops grown. Due to all these reasons the farmers on the island have resorted to rain dependent dry crops. Scarcely they grow during the monsoons a native variety of paddy which is resistant to either extremities of water availability.

The ground water is also not a reliable source of irrigation on the island because of its salt content. Only at a few locations water fit for irrigation is found. The rich farmers alone could venture to try for sinking well in their respective lands. The endeavors of digging a well many times prove futile for the water from it is not suited for raising crops. Hence we find only a few irrigation wells on the island and that too belonging to large farmers. These wells were locally termed as *mota bavulu*. They are open wells with wide circumference and the water from these wells are drawn by bullocks with the help of huge leather bags. It is such a laborious process to irrigate fields from the *mota bavulu* and the distant lands could not be irrigated easily by this practice. The farmers whose *lanka* lands are very close to water margins of the river use to dig ditches on the sandy banks.

These ditches are shallow of a depth of 4-5 feet with a slant furrow like path touching the bottom of the pit and the ground surface. The farmers walk down this furrow to draw out the swelling water. This sort of wells are called *nuthiguntalu* or *nelanuthulu*. Both men and

women carry water with pots from these wells to supply the plants. Continuous lifting of water exhausts these wells quickly and it may take considerable amount of time to pool up the water. As the river water seeps down into these pits the salt content of it is filtered through the layers of sand and soil. And hence the water from these pits is better than the direct river water for irrigation. These *nuthiguntalu* are dug during dry season to revive the dying plants due to water shortage.

Sinking of *nuthiguntalu* is easier than the *mota bavulu*. The *nuthiguntalu* are dug by the farmer himself. The labour requirements for digging them can be met within the farmer's family. This type of shallow wells are emergency service for saving the important cash crops like chillies and tobacco, and it doesn't demand any financial commitment. Whereas the construction of *mota bavulu* claims lot of money, time and service apart from maintenance expenses all throughout. But they last longer than *nuthiguntalu* with greater irrigation capacity. It requires to hire skilled labour who are capable of digging deep in and constructing the inner wall. For drawing water from such wells the farmer requires two bullocks and one person has to attend on the job. Thus in terms of expenditure the *motabavulu* are not in the reach of small farmers. As the *nuthiguntalu* are very simple in their structure and excavation they are adopted by both poor and rich farmers as to their needs and seasonal demands.

Agricultural Production

Under the then prevailing geomorphologic conditions of the island which is marked by acute shortage of irrigation usable water and lack of alternative means due to technological inadequacies the cropping pattern on the island was very much traditional type. The islanders used to grow vegetables like bottle gourds, pumpkins, ridge gourds, cucumbers, water melons, sweet potatoes, tomatoes, brinjals etc. They also produced commercial crops such as chillies, tobacco, gingili and ground nuts. One primary crop produced on the island was jowar which was the then staple food and scarcely *budama* (a native variety of paddy) was also produced.

Though different crops are produced on the island they were mostly confined to the wet season of the year for the reason that there is no reliable irrigation source during the dry season. Under the circumstances of high fertile soil and single crop pattern annually the agriculture yields are considerably high provided there is assured rainfall in the right season. Looking at the overall economic position of the islanders, it may be said that they are at hand to mouth existence. The high yield agriculture products are mostly vegetables which doesn't fetch remunerative returns because of poor marketing facilities. Though chillies, tobacco and oil seeds are remunerative, only a few farmers are able to grow them due to the limiting factor irrigation. Their yields are once again controlled by availability of water. And jowar was used for local consumption bringing no profits from outside. Thus the water management owing to its quality played an important role in economic prosperity of the islanders apart from other factors. In order to cope with the water condition on the island the islanders have adapted suitably their agriculture pattern by introducing new innovations.

Socio-Economic Scenario

Before we discuss innovations introduced recently on the island, it requires having a flash back of the socio-economic conditions of the island. The island is inhabited by four major caste groups –kapu, settibalija, mala and marakallu. These four castes belong to two different types of economic organizations, agriculture and fishing owing to the availability of two important natural resources of the island i.e. soil and river water. The land exploiting groups include kapu, settibalija and mala, where as marakallu solely depend upon river water for their subsistence. Here it should not be construed that the land dependent castes have nothing to do with river water. They do use river water for their domestic needs, for their cattle and to irrigate their fields in a limited way.

The water exploiting group refers to that group which directly rely upon the river water for navigation, ferrying and fishing for their livelihood. Navigation has been a prosperous activity for the island marakallu about five decades back. But in the recent decades it became unproductive with the construction of bridges across the river channels and canals, and the progress made in the road transport facilities. Consequently most of them resorted to fishing and a few to ferrying. Though there are changes

in the mode of water exploitation from trading to hunting with temporal fluctuations in their income levels, the marakallu more or less have a stable economy all through out.

Of the three caste groups that depend upon agriculture, the kapu are major land owners on the island followed by settibalija, while the mala are mostly agriculture labour with a few of them owning small fragments of land insignificant for subsistence requirements. The socio-economic scenario of the land exploiting group requires a flash back of about eighty years with regard to the land ownership rights on the island. The field labour cooperative society (FLCS) movement originated on the mainland has significant impact on the island socio-economic conditions. In response to the Indian National Congress decision taken at Kakinada conference in 1921 to broaden the base of independence struggle by extending its activities to rural areas, the British Government wanted to counter it by keeping away from the movement the down trodden groups by assigning them land and house sites. As a result the Harijan field labour cooperative society (HFLCS) was created and the government lands on the island were given to the mala. But in due course of time these HFLCS' were cancelled in 1950 on the pretext that they have not cleared the tax dues. At the same time the government has created all castes field labour cooperative societies (ACFLCS) in the place of liquidated HFLCS', thus paving way for the transfer of the *lanka* land on the island from mala to kapu and settibalija. These cooperative societies were not very successful for want of proper irrigation facilities. Irrespective of caste all the agriculture dependents suffered tough conditions for their daily bread on the island until the state seeds development corporation (SSDC) has come forward to adopt island for production of quality seed of jowar and maize. The cooperative societies on the island holding large stretches of land suited for SSDC needs which have in turn introduced new technology for agriculture development, including irrigation.

Innovation and Management of Water Resources

As a part of national programme the Andhra Pradesh State Government has established SSDC in 1960 in order to produce quality seeds to enhance agricultural outputs. Apart from the main objective of creating quality seeds, the SSDC is expected to mobilize farmers to propagate the quality seed for the sake of seed banks by providing infrastructure facilities and training the farmers in modern methods of cultivation. The SSDC has introduced the production of jowar and maize to supply seeds to the northern states where it is in good demand of staple food. The SSDC has preferred *lanka* lands along the river Godavari for this purpose since the loose soil, availability of moderately saline water and the fast blowing sea breeze found to be prerequisites for a healthy growth and good yields of jowar. Thus the seed cultivation for SSDC started during late 1960s in Ayodhya *lanka*. The availability of the favorable geomorphologic conditions and the existence of land owning FLCS have augmented the acceptance of seed cultivation apart from support extended by SSDC.

By then the FLCS' were possessing hundreds of acres of *lanka* land. Jowar cultivation requires continuous stretches of land such that the free blowing winds effectively bring about cross pollination. Moreover, no other crop or jowar of different strains should be grown between or in the vicinity of the seed variety to discourage undesirable traits. The FLCS' have met this requirement and members of different FLCS' have signed the agreements to raise crops according to the requirements of SSDC. In turn the SSDC has assisted the farmers initially by training them in the new methods of cultivation and then providing the input in cash and kind.

Apart from this the SSDC in collaboration with other departments of the State government has made arrangements for providing irrigation facilities for jowar cultivation which necessarily requires watering three times before harvesting once the flowering started. The tapping of river water for irrigation is not conducive and lifting of ground water is the only reliable means of irrigation. The government agencies helped the islanders to identify locations for sinking filter points where copious supply of water with least salinity are found. Diesel engines are used for lifting ground water. Each filter point can cater the irrigation needs of a plot of ten acres. The ten acre plot under a filter point can be owned by one or more farmers. In case of multiple ownership of the plot, cooperation is exhibited by the farmers irrespective of the fact of the location of the identified filter point. Any of the farmers can install the diesel engine bearing its cost as well as that

of drilling the filter point, utilizing the subsidies extended by the government for both the items. The land wherein the filter point is installed need not belong to the one who owns the filter point. The farmers are so accommodative that when the owner of the land is not able to bear the costs of filter point, he allows his neighbour to do it in his land.

Thus the filter point is open for free utilization of other land owners by paying a fixed amount (towards wear and tear charges) along with bearing fuel cost. The irrigation requirements of all the farmers arise at the same time as all of them sow almost simultaneously. When one farmer, generally the one close to the filter point start watering his field, the rest of the farmers get ready to follow the course. This helps the farmers to reduce the fuel expenses because, if the water channels gets dry, the farmers that are relatively far away from the filter point has to draw up more water to keep the channel wet and to maintain the flow. Thus each filter point has become a cooperative unit of farmers within the circumference of 10 acres. These farmers cooperate not only in sharing water but also in all other agriculture activities starting from sowing of seed, meeting the labour needs, removing the *keli* (extraordinarily tall plant with poor yields), chasing the pest birds, harvesting etc.

The introduction of seed cultivation and the consequent development of irrigation facilities have enforced hitherto unknown cooperation and coordination among the agricultural community of the island. The interdependency of the farmers has greatly increased under the new scenario of cropping pattern, new techniques of farming and irrigation technology. The cooperation among the farmers has surpassed the frontiers of lineage and caste barriers. The filter point has become the hub of cooperation in all sorts of activities. It is the members of the ten acre plot who form into a primary group to work collectively to accomplish various agriculture activities briskly or to raise their issues before the visiting SSDC officials.

CONCLUSION

The traditional knowledge of the islanders is found to be wanting in the new order of growing needs of the people. Though the extensive farming of dry cultivation prevents over exploitation of soil and water resources, it is proved to be incapable in maintaining day to day increasing population. The traditional techniques of *motabavulu* or *nelanuthulu* were ineffective to provide continuous irrigation to ensure agricultural abundance.

But with the introduction of seed cultivation the agriculture practices on the island are totally transformed. This development has first facilitated assured availability of water for irrigation throughout the year, paving way for intensive cultivation which subsequently led to new cropping patterns. The non remunerative vegetables and locally consumed country variety jowar are given up in lieu of the seed cultivation. The high profits drawn out of seed cultivation enhanced the economic levels of the islanders. The wealth thus acquired was invested on raising coconut plantation which is proved to be a better adaptation to the island situation. The sporadic location of filter points on the island necessitated new relationships and cooperation across the castes in the changed scenario. It changed the work ethic and also improved the economic well being of the people because of the remunerative returns from seed cultivation with ensured marketing facilities by SSDC.

As in the words of Levine et al (1973), irrigation is a system involving complex interaction of physical, social, economic and political components. More over the traditional economic relations (Prassad 1978) that are prevalent are fast deteriorating with the introduction of irrigation since most of them are cultivating their own lands. Though the new technology could not support the continuation of food crops, it has facilitated commercial crops. The subsistence economy of the island transformed into a market economy, effecting organizational changes in the community with the modern methods of irrigation.

REFERENCES

Childe, G.V.: *What Happened in History*. Penguin, Hamondsworth (1954).

Hunt, R.C. and Eva, H.: Canal irrigation and local social organization. *Current Anthropology*, **17:** 389-411 (1976).

Leach, E.R: *Pul Eliya a Village in Ceylon*. Cambridge University Press, Cambridge (1961).

Levine, G, Harold, C. and Petre, G.: The management of irrigation system for the farm. In: The *ADC/RTN Irrigation Seminar Report*. held at *Coronell University*, Oct 16-18, 1972. Published *Report No.2*, August. (1973).

Mathur, N.: Angami Nagas rituals and environment. *Man and Life*. **22:** 33-42 (1996).

Millon, R.: Variations in social responses to the practice of irrigation agriculture. In. *Civilization in Arid Lands*. R.Woodberry (Ed.). Anthropological papers

62, University of Utah (1962).
Prassad, K.S.V.: *Irrigation and Changes: A Case Study of an Andhra Village*. Ph.D Thesis. (Unpublished), Andhra University, Waltair (1978).
Steward, J.: *Irrigation Civilizations: A Comparative Study*. Pan-American Union, Washington. (1955).
Wittfogel, K.: *Oriental Despotism: A Comparative Study of Total Power.* Yale University Press, New Havens (1957).
Wolf, E. and Angel, P.: Irrigation in the old Acolhua domain, Maxico. *South Western Journal of Anthropology*, **11:** 265-281 (1955).