

## The Quest for Irrigation in a Semi Arid Area : A Study in Micro-Level Implications

P. Venkata Rao

*Department of Anthropology, University of Hyderabad, Hyderabad 500 046, Andhra Pradesh, India*

*E-mail: pvrss@uohyd.ernet.in*

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**ABSTRACT** Traditionally in semi-arid areas, farmers depended up on rain water, tanks and open wells for cultivation. Growing dry crops having different maturation periods under mixed cropping formed the mechanism for coping with the uncertain returns of dry cultivation. A shift towards commercial crops, which required more water made the farmers to go for individual bore-wells and pump sets. Availability of institutional finance as part of developmental programmes further added to this process. With the preference for private bore-wells, maintenance of tanks got neglected. Open wells got dried up due to the presence of powerful jet pumps in the vicinity which drew water from greater depths. With increasing use of ground water, water table is going down steadily, and the sustainability of cultivation is being threatened. The study points out the urgent need for evolving a water use and cropping policy for semi-arid areas.

Studies on irrigation point to the decline of traditional irrigation institutions in the colonial and post-colonial era. Access and control over ground water with the help of new technologies formed one of the important factors in this (Uma Sankari, 1981; Janaka Rajan, 1983). It has been argued that knowledge of traditional or indigenous irrigation systems will be useful in devising alternative organizations of irrigation management invoking peoples participation (Walter, 1979; Sengupta, 1985). Decline of traditional water utilization arrangements and the rise of dependency on technology leads to several changes in physical and institutional features. Following a ethno-historical approach, the present case study is an attempt to analyze the micro-level implications of irrigation based development in a semi-arid area<sup>1</sup>. The over-exploitation of water using modern technologies has lead to an unsustainable development in the delicately balanced ecological zone.

### THE AREA OF STUDY AND THE VILLAGES

Medak District is one of the backward districts in Telangana region of Andhra Pradesh. It generally experiences a dry climate. The annual rainfall in this district is 884.8 mm. The district has no mentionable rivers. Manjira and its two tributaries Haldi (Pasupu yeru) and Kudalair provide some irrigation. The total number of 2853 tanks in this district have been categorized in to short seasonal tanks numbering 2038, followed by 670 long seasonal tanks and 145 perennial tanks<sup>2</sup>. Narsapur Mandal where the study villages are located, shares the general climatic features of the Medak district. The area was under Jagirdari system during the rule of Nizam. Jagirdar had a hereditary right to collect revenue over the land. Jagirdars employed tenants, but also made land grants to owner cultivators.

The study has been conducted in the Lambada Tandas. Lambadas are a scheduled tribe. Tandas are the residential areas of Lambadas which are located away from the main villages inhabited by other castes. The Tandas studied are viz., Narsing Tanda, Tukya Tanda, Jagya Tanda, Taviriya Tanda and Jayaram Tanda. The first three Tandas come under the Mohma- dabad village of Chuppalaturti Panchayat, and the later two Tandas belong to Moosapeta and Nagulapalli Grampanchayats respectively. These five Tandas are contiguous in location and are at a distance of 10 km from Narsapur and 4 km from Raddipalli, a road-side village on black tapped road connecting Narsapur to Medak. The total population in the five Tandas is 585 of which 307 are males and 278 are females. These 585 Lambadas are distributed in 137 households<sup>3</sup>.

Lambadas who are also known as Banjaras are a nomadic group. Their ancestors are traced to Rajasthan. They are found throughout the western and central parts of India including Deccan. They are found in large number in Telangana part of Andhra Pradesh. The Lambadas are quite distinct from the local population in their dress, language, customs etc. In Andhra Pradesh Lambadas are granted Scheduled Tribes status in 1977.

Many Lambadas settled down in the area in the thirties when they were given land grants as part of the policies of Nizam Government to increase areas under cultivation. Slowly they developed expertise and purchased more land. Land became available more easily when some of the Muslim landlords left the area after the surrender of Nizams army to the Government of India. These landlords were supporters of Nizam and expected a back lash after the surrender of Nizams army. In the village by name Mohmadabad, of the total 199 households only four are Muslim households. According to the villagers Muslim families left the village due to the out-break of an epidemic (*gattara*).

#### SHIFT TOWARDS IRRIGATED CULTIVATION

Total land owned by the Lambadas is 332 acres which can be divided into dry land (170 acres), wet land (152 acres) and Regadi (10 acres). This land is distributed in 103 households. 34 households are landless poor depending up on labour, milch animals and herding. Jowar and maize formed the important crops in the dry cultivation. Pulses grown include *bobbarlu*, *ulavalu* (Horse gram), *kandi* (Tur dal), peas, and *chana* (Bengal gram dal). Millets cultivated are *ragi*, *samalu*, *taidulu* and mustard. *Kusuma* and ground-nut formed the oil seeds. Green and red chillies, tamarind also fetch some income. Like in other dry areas, mixed cropping with varieties having different maturation periods has been as adaptive strategy to cope up with the uncertain returns of dry cultivation. Staple crop jowar is mixed with crops like horse gram, red chana and peas. Sunflower is a recent introduction.

Paddy and sugarcane form the wet crops. The villagers used to cultivate wet crops using

rain water and tanks. There are two tanks adjacent to the Tandas. Of these, Moosapet tank existing in an area of 25 acres, dug by a Muslim Jagirdar about seventy five years ago, provides irrigation to fields in Jayaram Tanda. The tank gets filled when run-off water gets collected in the lower reaches. The revenue head of the village, Mali patel looked after the tank. Under him, a functionary called as Neerudi used to mobilize labour for maintenance works like desilting. Neerudi announces to the villagers about the date and time of opening the sluices and who should use water and when. After the abolition of hereditary village heads, Neerudi's work is being supervised by the village Assistant of the Revenue Department. Apart from his salary the Neerudi gets paid about 2-4 kilos of maize and 4-5 kilos of rice from each cultivator. During the study period only two households from Jayaram Tanda are receiving water from the tank to their fields and are cultivating about 3 acres of land. Villagers say that if the tank is full two crops can be cultivated under it, but in the recent years it was never full to that effect. The decline of the traditional authority system in villages resulted in poor maintenance of the tanks over a period of time. Unpredictable rainfall, silting, and water not being available in the farther reaches formed the reasons for decline of interest amongst cultivators in the maintenance of tank. Open wells which formed the other source of water became more attractive with opportunities becoming available for drawing water from them using mechanical and electrical power with the easily available financial support from different agencies.

#### DYNAMICS OF THE SHIFT

In the early fifties, the Lambadas were having open wells dug with efforts of collective labour. Such wells are not owned individually. Water used to be drawn from these wells using a *Mota* (Big bucket) tied to a rope pulled over a pulley by bullocks. Over a period of time big families having more land went in for individual family wells shared between brothers and relatives. Paddy and sugarcane started becoming more important in the seventies. Following the example set by the Reddy landlords in the vicinity, few Lambada cultivators went in for diesel

engines. The period between 1970 and 1980 witnessed significant changes in the area such as availability of electricity, starting of sugar factories, recognition of Lambadas as a scheduled tribe and grounding of a MADA (Modified Area Development Approach) project for their benefit. Commercial crop of sugarcane became attractive with the easier availability of institutional finance for digging bore-wells and getting electric motors. The traditional crops like jowar and maize were replaced by sugarcane, paddy and wheat, as they offered better economic prospects. But all the three consumed more water than the traditional crops. Dependency on tube-wells increased to maximum when compared to tanks and open wells. Between 1971 census and 1981 census enumerations in Mohamadabad village, to which three of the Tandas that are studied belong to, two important changes are noticed. Firstly, well irrigation (un-mechanized) disappeared. This is due to drying up of open wells or fitting oil engines and pump-sets to them. This explains the second change *i.e.* the increase of irrigated land.

A MADA pocket has been functioning in Medak district covering 13565 Lambadas in 4 villages. During the VI the plan period (85-90) an amount of Rs 23.4 lakhs was spent on irrigation with the distribution of assistance for bore-wells (24), development of wells (58), electric motor/oil engines (17), wells with electric motors (130), and community irrigation wells (127). Twenty four minor irrigation units were sanctioned in the Tandas, with each unit covering three persons. Identical items were distributed in MADA pockets present in agriculturally well developed coastal districts like Krishna and Guntur<sup>4</sup>. This means that Modified Area Development Approach did not differentiate between fertile Krishna district and semi-arid region of Medak district by emphasizing on tapping ground water for agricultural development.

Sugarcane was cultivated in small patches in the area in the early seventies. Sugarcane grown on a limited scale was locally used for manufacture of jaggery. The jaggery manufactured was used mainly in making country liquor. Better varieties of sugarcane spread in to this region from Nizamabad and Bodhan, where Nizam sugar factories are located. Jaggery mak-

ing became a more regular activity and Lambadas started selling jaggery in the Oosmanjunj market in Hyderabad. In a neighbouring village cash crops like sugarcane were said have been taken up initially during drought periods to avoid traditional payments to artisan castes (Kameswara Rao, 1974 : 311)<sup>5</sup>. Around 1977-80, attractive price offered for sugarcane by Kandasari sugar factories at Narsapur at a distance of 10 kilometres and Reddipalle at a distance of 4 kilometres made the Lambadas to take up sugarcane cultivation on a large scale. The sugar factories encouraged farmers to take up cultivation of sugarcane by supplying seed, fertilizers etc. on credit. Agricultural Development Bank of State Bank of India which was established at Narsapur, also provided financial assistance for this commercial crop. Sugarcane being a labour intensive crop needing more investment, only better-off farmers ventured into this. Small farmers preferred paddy which is of short duration but consuming more water. If water is not sufficient enough, Wheat which consumed less water formed an alternative. During fieldwork period the Lambada cultivators are getting 20-25 tons of sugarcane per acre which is being purchased at the rate of Rs. 650/- per ton. The temptation of growing this commercial crop is such that in the neighbouring Chuppalathurthi village where drip irrigation was provided under a scheme to encourage horticulture, beneficiaries started growing sugarcane in between Pomegranate and sweet lime plants which affected the growth of the orchard plants.

#### IMPLICATIONS OF THE RISE OF IRRIGATED CULTIVATION

The scramble for irrigated agriculture for cultivating sugarcane and paddy resulted in the preference for bore-wells. Financial assistance available under MADA helped the digging of bore wells. The spirit of collectivity got eroded with cultivators starting competing with each other in digging deeper borewells and drawing water using powerful jet pumps. This had led to depletion of water table. The fields of the Lambadas are dotted by dried up open wells and failed bore-wells on which cultivators have incurred debts. Local officials say that disregard

for the guidelines of National Bank for Agriculture and Rural Development which prescribe the maintaining of a minimum distance of 300 metres lead to the failure of the bore-wells. They say that spacing norms cannot be enforced by them. In the lands belonging to the Tandas one can see bore-wells in about 100 metres distance from each other. In another Telangana district, the justification for digging wells close to each other has been given like this. In these areas having limited aquiferous which are hydraulically unlinked, digging of wells carries a high risk of failure. Therefore wells are dug close to each other to share the aquifers<sup>6</sup>. Of the 36 bore-wells that were dug in the village, 26 are said to have failed. Only 10 are in working condition. The 10 bore-wells present are being shared by 27 persons, putting maximum strain on them. Lambadas are seeking of the services of private Geologists in their quest for water. All the seven huge open wells in the village had dried up years back. These traditional wells can not be dug beyond a depth. This situation is similar to the one described by Dhawan (1982) on disappearance of traditional wells due to mining of ground water using tube-wells.

The bores were dug with assistance from financial institutions and majority of them failing resulted in partial payment or non-payment of loans taken in many cases. The Lambadas were traditionally dependent on money lenders of Nagulapalli and Reddi landlords of Jankampet (Mohmadabad). But, they later started approaching Agricultural Development Bank, Manjeera Grameena Bank and Tricor. The twenty five Minor Irrigation Units sanctioned in the five Tandas during 1982-83 had 83 beneficiaries. Altogether Ninety seven instances of institutional credit, and thirty instances of non-institutional credits were reported during field work period. More than half of the loans are in the range of rupees two to five thousand while eight individuals reported having taken loans to the tune of Rs. 20,000/- and above (for purchase of tractors etc.). There are many defaulters in the Tandas to various institutional sources of credit<sup>7</sup>. When ever the electricity connections to the Tandas were cut-off due to nonpayment of charges, immediately the Tanda leaders rush to Narsapur to

meet the political leaders for bringing pressure on the officials.

Entry of irrigated agriculture has lead to replacement of the traditional inter-cropping by solo cropping. Inter cropping with crops which are drought sensitive and having different maturation periods has been on adaptation in semi-arid tropics. Mixing of reasonable balance of commercial crops and subsistence crops afforded a balanced nutrition. Leguminous crops which regularly replenished soil fertility, lost their place due to lure of commercial crops. Instead expensive chemical fertilizers obtained by taking institutional and non-institutional loans became a must for cultivation. Significantly when asked about problems they are facing, the Lambadas mentioned fertilizer prices, irregular supply of electricity, and non-availability of water. They reported that in the past five years, there was decrease in the rain fall. There was no recharge of water resulting in fall in water table. At the same time intensive cropping is going on.

The entry of the commercial crop sugarcane brought prosperity to the big farmers and opportunities for the wage earners. Modern gadgets like radios, tape recorders, mopeds, bicycles, wrist watches etc. are found among Lambada cultivators. All these speak for the income derived from commercial crop. Two tractors are owned in Jayaram Tanda and one in Tukya Tanda. The tractors and bullock carts of the farmers fetch income as they are hired for transporting sugarcane. The tractors are being employed to take paddy, hay etc. to Hyderabad for sale. A few individuals got employment in the sugar factories. The rise in the prosperity of Lambadas enhanced their socio-political position. Earlier Lambadas were dependent upon Reddis for employment as agricultural laborers, receipt of loans, and even settlement of disputes. The economic power of Lambadas made it possible for them to ignore the authority of Reddis. The Lambadas in the Tandas studied no longer consider themselves as subordinates to the Reddis, and the later are also conscious of it<sup>8</sup>. The impact of commercial crops made many individuals prosperous making them strong enough to question the authority of the Lambada Nayaks (headman), who are unable to assert their authority.

## CONCLUSION

The traditional cropping pattern in the study village involved cultivation of dry crops with patches of wet cultivation under open wells and tanks. The entry of sugar factories in to the region has been a major turning point. The attraction of income from the irrigated cultivation and commercial crops made the Lambadas to go in for tapping ground water. This process received a boost with MADA and other agencies offering easily available credit. With commercialization of agriculture and decline of traditional authority system, collective activities like maintenance of tanks and community wells are replaced by individual and private activities like bore-wells. The Lambadas have prospered, but the over-utilization of ground water has cast a shadow on the sustainability of the development. From the trends observed in the Tandas it appears that in near future a stage may come when ground water may not be available. Medak district is one of the twelve districts identified in the state through remote sensing technique as drought-prone districts with the depletion of ground water resources and reduction of forest cover<sup>9</sup>. Watershed management and other measures are being contemplated for conservation of ground water have not yet reached the area. There is urgent need for the proposed comprehensive law to prevent over use of water for ensuring management and development of water resources from a long term perspective.

The study empathizes the need to take into account the prevailing ecological conditions to devise suitable water management techniques and cropping strategies while encouraging irrigated agriculture in semi-arid areas.

## NOTES

1. The present study is based on the field work carried out by the author during December-January 1994-95 along with post-graduate students of Department of Anthropology, University of Hyderabad. An earlier

version of the paper was presented at the National Seminar on Ethno-Hydrology and Hydro-Mythology S.V. University, Tirupati, 6 & 7, March 1997.

2. This categorization is according to 1981 census.
3. I am thankful to Mr Satish Babu for the figures.
4. P-44, 45, 46 of the Eight Five Year Plan-Tribal Areas Sub Plan of Andhra Pradesh.
5. The village studied by Kameswara Rao (1974) is less than 8 kilometres from the study villages. Kameswara Rao also recorded the shift from Paddy to Wheat when there is insufficient water during dry spells (P-31).
6. Tusharshah (1993: 130) mentions this about Karimnagar district of Andhra Pradesh.
7. Robinson (1988) dealt with the significance of private money lending and institutional credit in the electoral politics of the area.
8. Robinson (ibid, 91-95, 146-149) traced the dynamics of the relation between Reddis and Lambadas in this region.
9. News item on Twelve districts drought-prone in Andhra Pradesh in The Hindu dated 27-2-97. News item in Law to ban overuse of water in The Hindu dated 17-2-97.

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