

for operating small diameter tubewells. For larger diameter tubewells above 2", power operated pumps are in use. In such cases, tubewells are provided with top-enlargements to accommodate the pump impellers. Prime Movers for running the pumps are either gasoline driven or diesel driven engines. The rise in price of these fuels are telling upon our

agricultural advancement. The electric motor driven pumps are very suitable to pump water for which rural electrification is very essential.

We have discussed in the morning session about the rural electrification. I welcome you all to discuss more elaborately on the different aspects of tubewell irrigation and its various perspective.

Address by Chief Guest

By

M. M. Choudhury

I feel a bit awkward to deliver before you and to express a few words because in the field of Engineering my knowledge is zero. In this function, three of our eminent engineers and scholars have been awarded Karmavirottama. Amongst them, Shri Prasm Sen took the award on behalf of his father late Gopal Chandra Sen. Sir Jehangir J. Ghandy accepted the award but could not attend the seminar physically due to indisposition. And the third, Dr, K. N. Modak accepted the award on behalf of his father Late N. V. Modak but could not attend the function due to various preoccupation. The life sketch of the three Engineers and Scholars who have been awarded such title Karmavirottama have been given in the meantime. We are very sorry that we have missed the presence of those distinguished Engineers. I find in the life sketch of Dr. Sen that he passed the I. Sc Examination in the year 1929 from the Calcutta University. I am proud that I also passed the I. Sc. in the same year from the same university. This is one of the reasons that led me to participate in this Seminar.

India is a developing country. You have so many things to do. We are almost in slumber. In the British regime, Indians were not allowed to demonstrate their talents to the fullest extent. For many reasons, their talents were ignored and they were not given opportunity to carry on their works. But to day things have changed. Many things are in the mind of the people. People want to have all facilities and amenities of life.

Mahatma Gandhi built the Indian people and you, the engineers are to build the country. You should know, there are yet things to be done. Many things are yet to be done than we have achieved. I don't like to go in for a long speech. I want to say or simply emphasize on one or two points.

India is an agricultural country where 82% of the population depends on agriculture for their livelihood for many years to come and unless we develop our agricultural economy it will be foolish to think that prosperity has come to the nation. If we want prosperous India, we must build up our agriculture. Many developments have occurred in urban areas but

no man in the village yet feels that there has been any change.

Now the question arises, how we are to develop our agriculture. First of all, if you want to have good cultivation, you require good seeds. Good seeds may come up from researches in the laboratories. Engineers and scientists can do such work. Second thing is technical know-how of the people. You are talking about pumping sets for irrigation, lift irrigation and talking about so many technical implements are to be applied in the field of agriculture. But you should know, unless and until the people of the village learn the modern technical know-how, the above will have no use to them. If you really want the application of the machines, the tools, and the implements in the field of agriculture, the villagers must have the facility of learning such know-how first. They should know the techniques of the mechanised cultivation. If you really want uplift of rural communities, effort should be made to extend the knowledge of technical know-how to the people. They should learn to know the component parts of the machines, tools, etc. otherwise when the implements, they use, are gone out of order, they won't be able to mend them, won't be able to run them as a result the machines will lie idle. All the money spent on those machines from their pockets will become useless to the cultivators.

I have moved from one village to another. I can understand directly from men behind the machine under what difficulties they are suffering from. I find in this search that they do not understand how to handle the machines even though purchased for cultivation out of their hard money. They may get some credit from the banks out of which they spend on water pumps or irrigation pumps or tractors and so on. But as a matter of

fact, inspite of their endeavour and sincerity, they cannot run their machines for cultivation. To all engineers and research scholars, I like to emphasize that we should see how best we can extend the know-how of modern equipments to the rural communities in the field of cultivation.

Irrigation is a primary thing for making Green Revolution a success. We often hear in some quarters people say that Green Revolution has been a success in India because for one and two years there have been bumper crops. This has happened, I believe, because of right monsoon. Otherwise, I think, there would not have such scarcity of food in drought areas. When subsidiary crops are harvested, how could we say that we have been successfully achieved Green Revolution? It should not be a temporary one so that in one or two years we shall have such revolution. It should have permanent value. If we can supply water to cultivators in time, they will be able to produce bumper crops. In this sphere your service is very, very and very essential. You are talking about tubewell irrigation, deep tubewell irrigation, river valley projects, multipurpose projects; you are talking about lift irrigation. But unless water supplies from these sources are not within the means of the cultivators, nothing can be achieved. My own experience in this regard is that the people cannot pay the money levied on them. We should see how less costly an irrigation project can be made so that the cultivators can utilise them at less expenditure.

The Rural Electrification comes, secondly in the picture. In your Souvenir I have read that you want rural electrification for urbanisation so that the immigrants from villages to towns are minimised. That may be one of the purposes that the rural electrification should be made. But then main purpose of rural elec-

trification is not to urbanise villages in order to check men to leave villages. The main purpose of rural electrification is to help them in developing India's economy. If they are to use light etc. in homes and domestic purposes, they are sure to face the burden of economic trouble. Therefore, power should be utilised for the purpose of improving condition of the villagers. We should see how extensive use of electricity in irrigation and also in rural industries like small scale industries and cottage industries can be done.

We find congestion in towns and villages.

Villagers are more or less slum people. What we need is the improvement of roads. Here in the Metropolis of Calcutta, the lanes and roads (some of course) are hardly 5 ft. wide. In a city like Metropolitan Calcutta, a city which is a pride of every Indian, 3/4th of the roads and lanes are hardly 5 ft. wide. Some thoughts should also be given on this side. I now like to pass on this idea to you because you are the fittest persons to know how the villagers could be uplifted. Once again, I express my gratitude to you for calling upon me to come over here. Thank you.

Presidential Address

by

M. S. Balasundaram

Introduction

As a developing nation with over 560 million people, India is facing a gigantic task of economic development next only to that of China. Our problems are diverse and varied. Viewed from natural and human angles the most urgent and fundamental problem is to ensure self-sufficiency in the food resources for the nation on a firm and continuing basis. Thus agriculture gets the highest priority in our national plan for development.

With 162 million hectares of good arable and, India is favourably placed with regard to

the basic resource for agricultural development. The arable lands of the country for most part again are not covered seasonally under ice or snowfall (as in large parts of China) although certain sectors do have other constraints such as semi-arid to arid climate which are natural detrimental factors towards development of intensive agriculture.

Land and Its Water Potential

Within the physiographic and climatological variabilities India's total land area may be classified under six categories as shown in Table below :

| Sl. No. | Region | Geographical area sq. km. | Area under forests steep hills, etc. sq. km. |
|---------|--|------------------------------|--|
| 1. | Desert Region | 202,500 | - |
| 2. | Hard rock region with variable soil cover and in-land valley fills | 1,560,000 | 345,600 |
| 3. | Coastal plains excluding Konkan coast | 449,500 | 97,200 |
| 4. | Sindhu-Ganga-Brahmaputra plains | 501,750 | 97,700 |
| 5. | Himalayan region | 501,000 | 141,700 |
| 6. | Konkan coastal region | 45,250 | 1,100 |
| Total : | | 3,260,000 | 633,300 |