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READING, WRITING AND CULTIVATING: THE ROLE OF LITERACY IN IRRIGATION

Juliet Millican

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READING, WRITING AND CULTIVATING; THE ROLE OF LITERACY IN IRRIGATION

Juliet Millican

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READING, WRITING AND CULTIVATING; THE ROLE OF LITERACY IN IRRIGATION

Juliet Millican

1 INTRODUCTION

This paper contributes to the discussion on the relevance of literacy to irrigation. It examines the role of literacy in promoting greater independence of farmers' groups, and considers literacy in relation to issues of farmer participation and 'responsibilisation'.

The arguments are based on the author's own experience as coordinator of a literacy programme within an agricultural project in Senegal, which worked particularly on post literacy and extension.

The second part of the paper outlines methods of working with farmers in the training of trainers and include examples of training materials and activities developed in the field. These will be published later this year and available from the Department of Agricultural Education, University of Wageningen, The Leewenborch, Hollanseweg 1, Postbus 8130, 6700EW Wageningen, The Netherlands.

2 THE ROLE OF LITERACY IN IRRIGATION

2.1 Projet Ile à Morphil

Projet Ile à Morphil began in 1979 as a Senegal government project which, with the aid of Dutch support, constructed small-scale irrigation schemes for rice growing. On the banks of the Senegal river, and very much a part of the Sahel, the project formed one of a series of agricultural projects aimed at increasing national rice production. Land was owned and cultivated by local farmers and organised on a village basis, but production was managed with the help of the SAED[1], the governmental organisation responsible for developments in the river valley.

[1] *Société d'Amenagement et d'Exploitation des Terres du Delta, Senegal*

Inputs, in the form of fertiliser, diesel and pesticides were supplied on credit to the farmers though the SAED's regional offices. Debts were repaid after the harvest, sometimes in notes but often in the form of rice. Debts that remained unpaid were, on occasions waived, or carried over to the following season. Subsequently, farmers could often avoid dealing with management issues or with money, while at the same time being tied into a system that was not their own. However, during the 1980s, as a result of fluctuations in the international market price of rice, coupled with inappropriate management, the SAED met with financial difficulties. To escape from increasing debt, and as a policy fo stimulating private investment, SAED began to withdraw from management activities. This policy of 'responsibilisation' was presented as the 'removal of barriers to private investment and the development of private enterprises'. On Ile à Morphil, irrigation schemes were to fall under the management of farmers' groups organised into cooperatives. For more information on the withdrawal of SAED, see Woodhouse (1990) and Broeshart (1990).[2]

The SAED's policy of 'responsibilisation' brought with it mixed reactions. Although it was to take place in stages, the first stage was a sudden withdrawal from the provision of credit, the supply of inputs and the marketing of rice. This meant, in real terms, farmers forming themselves legally into recognised 'group d'interets economiques' or 'section villageoise', if they were to open a bank account and to trade. The project intervened by introducing a revolving fund, but rice had to be marketed in order to make repayments into the fund, and the ordering of inputs had eventually to be taken over by the group. If farmers were to do this themselves they needed to be literate.

2.2 Literacy and Cooperatives

Cooperatives were not new in Senegal. They had been introduced on a large scale in the 'peanut basin' in the centre of Senegal during the 1960s. By the end of the 1960s there were almost 2000 throughout the country,

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[2] *Woodhouse, P (1990) 'The Disengagement of the State from Irrigation in the River Senegal Valley and its Implications for Irrigation Design'. Paper presented at the International Workshop on Design for Sustainable Farmer-Managed Irrigation Schemes in Sub-Saharan Africa', Wageningen University, 5-8 February 1990.*

Broeshart, M (1990) 'Privatisation in Irrigated Agriculture; a Chance for the Deprived or the Priviledged?'. Position Paper, Department of Irrigation, Soil and Water Conservation, Wageningen Agricultural University.

with a monopoly on the marketing of peanuts. But as a means of generating credit they were new to the rice producing areas of the North. During the 1960s, Guy Belloncle, known for his work on cooperatives and on farmer participation in irrigation, worked as a technical assistant to the Senegalese cooperative movement. Belloncle saw cooperatives as having two important functions. Firstly, they enabled farmers to create collective capital, either in kind or in cash which could generate an investment budget at village level. Secondly, they could provide a framework in which eduction, particularly non-formal eduction was both necessary and feasible.

Belloncle also draws from the early cooperatives several important lessons.[3] He felt that many of them had failed due to bad record keeping and a lack of joint responsibility. Accounts sheets that were kept relied on a complicated system and were written in French, a language few farmers understood. Inadequate keeping of accounts led in many cases to embezzlement of funds and exploitation of the many by the few. If cooperatives were to succeed in replacing the SAED in the management of irrigation they needed a revised system using simple account sheets printed in the Senegalese languages, and a training programme that dealt with both literacy and responsibility.

The organisation of farmers for the management of water in an irrigation scheme lends itself easily to the formation of credit groups or cooperatives. The groups not only provide an obvious framework or focus for a non-formal education programme, but education for better management, accounting, record-keeping and literacy training becomes integral to the survival of the group. Some of the UNESCO literacy programmes (e.g. Experimental World Literacy Programme) were unsuccessful because they took a purely functional approach. Literacy was linked with limited skills, with training someone for a particular task in order to increase production. Paulo Freire, the Brazilian educator with a more radical approach to literacy campaigns, has been identified as being most relevant to a revolutionary situation. Freire saw literacy as part of a political process in which, through discussion and consciousness raising activities, individuals become aware of their ability to affect the world around them, and thus operative in the development process.

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[3]See Belloncle, G and Bergmann, H (1984) 'Farmers' Associations Making them Effective or Making them Unnecessary', *Irrigation Management Network, Paper 9c.*

Literacy for self-management within cooperatives requires a combination of these two approaches; one that is both tied in to production and has the capacity to empower. Its importance is needed and recognised by the farmers themselves, which makes it potentially a powerful programme. It not only serves the administrative needs of production, but provides a framework for increasing agricultural knowledge and improving organisational skills.

2.3 The Senegalese Literacy Programme

The syllabus used on Ile à Morphil was produced by a local training organisation and based broadly on the teaching methods of Paulo Freire. In a Freirean model, letters are introduced throughout the discussion of a picture indicating a familiar scene. From the discussions a phrase or slogan is deduced, and the trainer takes from this a word, then a syllable, before arriving at and teaching the letter of the day. As a method it puts letters and literacy into the context of words in every day language, and works from the familiar to the new. In the Senegalese syllabus the choice of pictures centred the discussions around irrigation and agricultural problems, and provided an overlap between literacy and extension.

As part of their training the literacy trainers were given some background in extension issues, but were trained more fully in communication skills. Without the higher education that many extension agents had received, they were more likely to speak the same language and use the same terminology as the people they worked among. Consequently, with the regular, weekly structure of a literacy programme, and meetings three times a week, their function as communicators was as important as their function in literacy.

Literacy and numeracy were taught alongside each other, and the numeracy syllabus provided the background for accounting. Groups had to learn to measure and to calculate surface area if they were to order supplies, to weigh and to multiply if they were to market their produce successfully, and to divide costs and record subscriptions in order to set up an effective system of repayments. If groups were to function collectively and responsibly everyone had to identify with the system and see it as something of their own.

The move towards 'responsibilisation' is not unique to Senegal. It is happening throughout the Sahel, if not throughout Africa, and comes at a time when people are debating more than ever before issues of farmer participation and questioning why projects fail. The crucial issues, both to the early Senegalese cooperatives and to our experience on Ile à Morphil,

seem, as Belloncle points out, to be pedagogical in helping farmers to deal with the administrative tasks involved, and sociological in developing a personal and corporate responsibility.

The method and the syllabus inherited began to deal with both those issues, but it seemed not to go far enough. The syllabus ended with the teaching of the last letter of the alphabet, when it was felt that students could technically read. The SAED defined 'post literacy' merely as the introduction of account sheets, which they felt that farmers, having learned their 'letters' and 'numbers', should be able to use. They produced a series of these (for recording individual subscriptions, group loans, expenditures, repayments, etc) which were to be introduced by the extension agents during their visits to the field. The literacy trainers were to "assist them in this task", but it soon became apparent that if record keeping was to work, a much fuller programme was necessary. If farmers were to take over responsibility for their scheme they needed to learn about that responsibility, if they were eventually to use a system of accounting without outside help they first needed constant practice in the different steps involved. Thus the programme had to create a controlled situation in which management tasks could be broken down into manageable steps, and 'tried out' without the disastrous financial consequences of making mistakes when doing it 'for real'.

A post-literacy programme provided the obvious format for this further training. The literacy trainers, with a good rapport already established in the villages, seemed the obvious people to carry it out. But first they themselves needed to be trained. Although interested and enthusiastic and reasonably good communicators, they had learned a series of techniques which enabled them to work in a very prescriptive way. They had to become more flexible and creative in their approach if they were to develop a new programme that met the particular needs of the village concerned.

2.4 The Post-Literacy Programme

On beginning to consider a post-literacy programme the same two issues seemed to reappear. The pedagogical one of becoming sufficiently familiar with numbers, weight, area and quantity, to be able to manipulate them for higher rewards, and the sociological or personal one of taking on the responsibility for administration and management. If the aim of post-literacy was to facilitate the taking of responsibility, that process needed to be integral to a post-literacy course. Groups had to be encouraged to solve problems independently without the support of the literacy trainer, and to determine their own needs.

It also meant abandoning the prescriptive format of set activities that a literacy class entailed, and following the group's lead. The literacy trainers had to learn to set up activities relevant to the village that groups could work on alone. They needed to develop a range of teaching methods in order to build up a programme around issues the group raised. Traditional attitudes of a teacher as didactic had to be broken down and the participants encouraged to 'participate'. We experimented with role play, with simulation, with blackboard drawing, with practical work and with games.

Discussions around these issues also brought up the question of knowledge input versus self-direction. If a group was to determine its own direction and set its own syllabus (as a Freire model would encourage), how would a trainer ensure the necessary amount of controlled practice and new information?

Beyond that it called into question the role of the literacy trainer. Where, in working with an extension agent did their functions overlap; what were the dangers inherent in this; how could they ensure that they complimented and didn't contradict each other? During an initial workshop these issues became apparent and I was aware of the confusion involved. In order to communicate my own fears and to try to clarify this I invented a story, the story of Ali, which has been retold below.

The impact of the story was such that it convinced me of the importance of story telling as a medium for communication. Not only did it generate a lot of very useful discussion on the role of a post-literacy trainer, but it seemed to solve the dilemma of knowledge input versus self-direction.

2.5 Story Telling and Simulation

A post-literacy programme based around story-telling and simulation activities seemed to follow on well from a programme based around pictures for discussion and the learning of letters. Stories also have a significant advantage over the use of pictures. Pictures require that someone is visually literate, they entail quite a complex understanding of images (as well as the problems involved in the producing and storing of these images), and they generate discussion about things that are known. Stories are not only more familiar than pictures to village communities, but can introduce new issues and new information into a familiar situation.

They serve as a trigger for discussions around areas a group may not have thought of alone, while leaving the direction of the discussions open. Within the literacy programme farmers were already familiar with the

process of using a phrase from the discussion to introduce a letter, and the different subsequent activities associated with the making of words. I felt a similar process could be adopted in post-literacy using discussions around a story leading on to different tasks. A series of tasks, divided into steps, could be set up to simulate some of the real tasks involved in the management of agriculture. A story based, for example, around a farmer who decided not to buy fertiliser might lead to a calculation of the required amount for a field of given dimensions, a comparison of figures giving yields of fertilised and unfertilised crops, and a deduction in monetary terms of the overall value of using it. Lively stories based around recognisable characters are not only memorable, but encourage the listener to identify with and to explore the different issues involved. Working in groups to solve a problem meant the group applied the information they had gained and could test for themselves whether or not it was useful.

The same format of story and simulation could easily be adapted for the training of trainers. A story covering issues of appropriate teaching methods or the need for planning could be followed by a simulation exercise that involved planning the time and activities necessary around a set theme. By listening and responding to the story, and working in groups on a set task, a trainer was at the same time experiencing the effects of story telling as a teaching method, and learning how to construct stories and exercises for their own classes. The balance of story telling and simulation seemed for trainers and for farmers to provide enough scope for creativity in raising problems and discussing significant issues, and enough direction to enable them to tackle 'a real' and clearly defined task.

In order to help the literacy trainers remember and re-use activities developed in training workshops, particularly when working on their own, we compiled them into a book. Called 'Reading, Writing and Cultivating; a Resource Book for Post-Literacy Trainers', it follows a similar format of stories and related activities. It is directed towards trainers and extension workers involved in agricultural projects and particularly in irrigation, who may have had no more than a secondary school education and may be unused to learning from books. It aims to cover teaching and learning methods in simple language, and includes information on setting up village libraries and newspapers, introducing account sheets, creating village projects and compiling games. Different pages from the book are included in the second part of this paper.

2.6 Literacy and Irrigation; Some Conclusions

The importance of literacy to irrigation seems to be greater than the sum of its defined parts. For farmers to participate in and take responsibility for the management of an irrigation scheme they need to be in charge of the results of their actions, and the recipients of the profits and losses incurred. In order to do this they need certain administrative skills. As with any trading organisation they have the option of 'buying these in'. However, in order to gain a wider knowledge of the economics of production, and to avoid exploitation, it is obviously advantageous to the group as a whole to develop them themselves.

Learning how to use figures in order to weigh up advantages, helps a group to make informed decisions about what and where to cultivate, and when and where to sell. This 'hard' information, coupled with the farming/ market/ storage/ individual problems of the area, gives a framework in which plans can be made and problems solved. The format for literacy and post-literacy training itself provides a platform for new agricultural information, to be debated within the classes or passed on through the newspaper or 'village libraries' that a post-literacy programme can contain.

Access to new information, and a broader sphere of knowledge helps put the significance of irrigation into perspective; and farmers do, in the end, need to have 'the whole picture' if they are to take responsibility for, and manage successfully, what is essentially an imported system. Taking responsibility entails making choices, and up to date information is crucial if the right choices are to be made.

Indigenous education exists in some form in every African society. According to Jakayo Peter Ocitti, professor at the Makerere University of Uganda, it generally has two functions; a socio-moral one and techno-occupational one. The socio-moral aspect, one's role and responsibilities, is passed on through stories, proverbs, songs and games. The techno-occupational content is learned through watching and doing, through trying it out for one's self. The aim of indigenous African pedagogy is that the individual should be able to do something, and to understand the reason, in community terms, for that task being theirs.

As trainers, this could be lesson to ourselves.

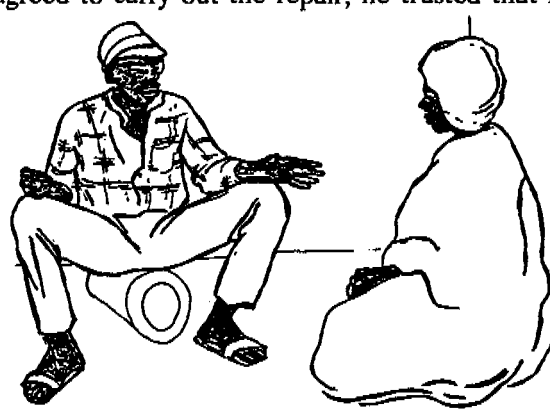
3 READING, WRITING AND CULTIVATING; SOME STORIES AND EXERCISES

3.1 The Story of Ali; a Warning

Last year, in a village quite near here, a literacy teacher was sent to set up a class. His name was Ali. The villagers welcomed him warmly. They liked his good humour and his enthusiasm, and felt he would make a good teacher. Both men and women came regularly to his classes which always began with a lively discussion about rice growing, budgeting or preparing food. Things seemed to be going well. Ali worked hard; he was a good teacher, he was also very proud.

One day, during a class discussion a student, Ibrahaim, asked a question about repairing a crack in an irrigation canal. There were cracks appearing in the canal next to his field. Ali wasn't really sure what the solution was but realising his students thought highly of him was reluctant to admit he didn't know. Ali, as I said, was very proud.

He thought for a while about everything he'd ever heard about the maintenance of canals and made up what seemed to be the right answer. Pretending a confidence he didn't really have, he answered Ibrahaim, and Ibrahaim agreed to carry out the repair; he trusted that Ali was right.



A couple of days later Ibrahaim was in his field trying to repair the canal in the way Ali had told him without much success. The farmers' advisor walked by and saw what he was doing. "Hey, Ibrahaim", he said when he had finished his greetings, "That won't help at all. Whatever are you trying to do?" Ibrahaim explained what had happened in class. The farmers' advisor smiled. "No" he said, "this is how you repair cracks in the canal", and he showed him a completely different way.

Now Ibrahaim was confused. Ali, the literacy trainer, his teacher whom he liked and trusted, told him one thing, and the farmers' advisor whom he'd known for a while, told him another. He didn't know what to do, so in the end he did nothing. The cracks in his canal grew worse and worse.

A week later it was so bad that Ibrahaim decided to travel into the town and see the manager of the region hoping he would be able to solve the issue. So he saddled up his donkey and set out. The journey took him half a day. When he arrived he was hot and tired, but the manager agreed to see him and Ibrahaim presented his problem. The manager gave him the answer quite simply, it was as the farmers' advisor had told him; Ali had got it wrong.

Ibrahaim then rested before returning by donkey to his village. When he arrived it was already dark so he couldn't begin to carry out his repairs before the following day. By this time the cracks had grown so large that although the repairs worked, they took a lot more time and a lot more work before the canal was strong again. And, because of the work involved the whole village soon got to hear of what had happened.

Ali continued to work as a literacy teacher in the village, and Ibrahaim continued to come to his classes. But some of the students decided they wouldn't go any more, and even those who did never knew when to believe what Ali was telling them. Ali, because of his pride, had suddenly lost their trust.

This story raises many questions, for example:

(a) what is the role of the literacy trainer?

(b) how much agricultural and technical information can be given or discussed in a literacy class?

(c) how much does a literacy trainer need to know about agriculture and irrigation?

(d) what is the best thing to do when someone asks a question you cannot answer?

Try to answer some of these issues for yourself, in view of the story and its similarity to your own situation.

3.2 The Post-Literacy Trainer

Traditionally, 'teachers' in African society are the eldest people in the village. They know the most because they have had the most experience of life. They have, therefore, earned their position and deserve respect.

Changes in agricultural development have meant the introduction of things which older people have not always experienced. In these new situations they may not have the most knowledge. From time to time elders are now in a class asking questions of a much younger trainer. They themselves are not too ashamed to say "these things are new to me; I don't know them, and therefore I am here to learn."

Ali lost the respect of his village because he pretended he knew something he was unsure of. The role of a village trainer is a new and strange one. At a young age you may be in a position of giving information to the elders. It is a position not to be misused.

In a school class room the teacher has the advantage of age, and usually knowledge over the children. In an adult class the trainer has the advantage of some knowledge, but by no means all. There are many things, for example, rice farming, the seasons, crop diseases, and life itself, about which the students will often know more. About some things no-one in the group will be informed.

As trainers what we need to be good at is working with people; helping students to share, to understand and to use whatever information is available.

It is perhaps more helpful to see ourselves not as teachers or givers of knowledge, but as communicators or sharers of knowledge; more helpful not to try to learn all the answers, but to practise encouraging students to search among themselves for their own solutions, and, where answers are missing to know where to go for help; most useful not to just listen to the problems and grumbles of farmers, but to communicate those problems to the people who may be able to do something about them, for example, the farmers' advisors, the manager of the region or the project staff.

By becoming a good communicator, a trainer can help keep information moving between the people who need it most.

A good group leader will not dominate the class by talking about what they know, but through question and encouragement will help the group to share the knowledge it has and try to apply it; will not try to impress

the group with complicated explanations or language that is difficult to understand, but will use familiar terms and local examples to help make new information clear.

3.3 Problem Solving in Groups

Giving students problems to solve in pairs or in groups keeps everyone involved and gives them a chance to share their own ideas with each other. It will involve you, as a trainer, setting up the problem and being around to answer questions where necessary. The size of the group will depend on the problem set and the number of people in the class.

One way to do it is by 'pyramiding'. Pyramiding means beginning by thinking about something on you own and gradually discussing it with more and more people, for example:

(a) Present a simple problem to the class and ask students to think about it individually for 3 minutes;

(b) Ask students to get together in pairs with the person next to them and share their ideas with each other for 5 minutes;

(c) Ask each pair to get together with another pair and to find out if anyone has any ideas they have not thought of. Give them 8 minutes;

(d) Finally, bring the class together and discuss the ideas of the whole group, listing the main points on the board.

Working in this way will help give students who are shy more confidence in speaking in front of everyone. It might be useful to add more information or to make the problem more complicated at each of the four stages, for example:

(a) Think about where you would go if you needed to borrow money and jot down some ideas of your own;

(b) Discuss your ideas in pairs, and think about how you could borrow a lot of money, say 150,000 FCFA[4] in order to buy inputs for one season;

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[4] *FCFA - CFA Franc; in 1989, US$1 = 319 CFCA, £1 = 523 CFCA*

(d) Share the ideas with the whole group and go on to talk about ways of recording loans, and the problems involved in taking credit.

A short problem, like the one used above in pyramiding might take up half an hour of class time. With a longer problem involving several different tasks, a single group might need a whole session to complete it.

In setting up a problem:

1. make sure the situation you describe is similar to a real life situation that your students might have to deal with;

2. see that everyone has enough space to work in and many material they might need;

3. allow groups to spread out, both inside and outside the classroom so they are not disturbed by other groups;

4. give **clear** instructions on exactly what you want your students to do;

5. be available to answer questions where needed, but try not to solve a problem or make decisions for the group; allow them to find their own solutions;

6. leave sufficient time at the end of the session for students to report back to the rest of the class on what they have found, and for a discussion of the results.

A problem set in an area where students are growing vegetables might be:

Imagine you have a communal garden which everyone in your group will work on. The total area of the garden is 3 hectares. Someone suggests planting 0.5 of a hectare with cassava.

Calculate how much cassava you would need to buy to plant the area, and how much it would cost. If your harvest is good and you are able to sell 50% of your crop how much money will you make? Divide the remaining 50% between the group, how much will each of you have? Share the profit between the group, how much will each of you have? Are there any more expenses that should have been detracted from the profit?

Decide:

1. if 0.5 of a hectare is all you want to use for cassava;

2. how you will record money spent and profit made; how you will divide the work involved between you;

3. if you want to use any of your profit for communal activities?

3.4 Role Play

With some situations you might ask students to act out a part of the problem in order to make the experience of it more real. This is called role play. A role play does not involve learning parts or lines. Generally, it is spontaneous with little or no practice. In small groups students are asked to play a given character, or themselves in a given situation. As with problem solving the situation should be made clear and as close as possible to everyday life.

Using role play allows students to feel what it is like to be someone else, or to be in a different situation, before attempting to discuss the problem involved.

Role plays can form a useful part of certain themes. They can help students to develop confidence in themselves and try out roles of leadership or management.

However, in some areas it is culturally difficult for people to act in front of others; don't ask your students to do it until you know them well and have developed a feeling of trust in the group.

Try taking on a part yourself to demonstrate the technique, and always leave enough time afterwards to discuss the issues raised; a ten minute role play may generate an hour's discussion.

An example for a role play concerning irrigation might be:

A farmer constantly takes too much water into his field. His field is also badly levelled. In order to get enough water in the middle of the field the plants at the sides are suffering from too much.

He is also wasting pumping time, and keeping other people waiting for water. The president and vice-president of the group are asked to speak to him about it. The farmer tries to defend himself.

Plan for Role Play

Problem:

How to make someone understand the importance of levelling a field and complying with the rules of an irrigation system.

Actors:

Farmer 1 with badly levelled field;
Farmers 2 and 3 with neighbouring fields (they report farmer 1 to the bureau);
President and vice-president of the group (they have to sanction farmer 1).

Action:

Begin with farmers 2 and 3 in the field discussing farmer 1;
They try to explain to him themselves why he should level his field and use less water;
Farmer 1 refuses to listen so they decide to report him to the bureau;
Continue with the scene between the president and vice-president sanctioning farmer 1 and farmer 1's defence.

Time:

10-15 minutes.

Questions for discussion following the Role Play:

1. How important is it to comply with the rules of the group?
2. What rules should each system have?
3. How can you reprimand someone who doesn't respect the rules?
4. Did the people in the role play explain clearly the reason for each of the rules?
5. What is the first farmer now feeling?
6. Will he respect the rules in future or is he just angry with the people you reported him?
7. Is it fair to report on someone who is breaking the rules?
8. Could anyone have acted differently in the same situation?
9. How did the president and vice-president feel about the sanctioning of someone?
10. What have you learned from the role play?

Successful role plays which develop general awareness of social problems can often be turned into theatre and performed in front of the whole village.

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