ISSN 1019 - 9624

বাংলাদেশ পল্লী উন্নয়ন সমীক্ষা
The Bangladesh Rural Development Studies

খন্ড ১০	১৪০৯	সংখ্যা ১
Volume X	2002	Number 1

প্রবন্ধ
Articles

পল্লী উন্নয়ন একাডেমী, বগুড়া - এর সাময়িকী
A Journal of the
Rural Development Academy, Bogra

Advisory Board

Mr. S M Jahrul Islam — Chairman
Director General
Rural Development Academy, Bogra

Mr. Abdul Muyeed Chowdhury — Member
Executive Director
BRAC, Dhaka, Bangladesh
&
Ex-Executive Head
Rural Development Academy, Bogra

Mr. M. Nurul Haq — Member
Ex-Executive Head
Rural Development Academy, Bogra

Dr. Anwarullah Chowdhury — Member
Professor
Department of Anthropology
University of Dhaka

Dr. S.M. Altaf Hossain — Member
Professor
Department of Agronomy
Bangladesh Agricultural University
Mymensingh

প্রকাশক ঃ **মহাপরিচালক**
পল্লী উন্নয়ন একাডেমী, বগুড়া
বগুড়া- ৫৮৪২, বাংলাদেশ

Published by ঃ **Director General**
Rural Development Academy, Bogra
Bogra – 5842, Bangladesh
Email: rdabogra @bttb.net.bd
Web : www. rdabogra.com

প্রকাশকাল ঃ ডিসেম্বর, ২০০২
Year of Publication ঃ December, 2002

মূল্য ঃ টাকা ৭০.০০ (প্রতিষ্ঠানের জন্য)
ঃ টাকা ২৫.০০ (ব্যক্তিগত ক্রয়ের জন্য)
ঃ মার্কিন ডলার ৩.০০

Price ঃ Tk. 70.00 (For Institution)
ঃ Tk. 25.00 (For Individual)
ঃ US $ 3.00

Computer Composed ঃ **Md. Abdul Bakey**

Printed by ঃ **Tajma Art Press**
Akboria Market, Thana Road
Bogra

সূচী

CONTENTS

ISSN 1019 - 9624
The Bangladesh Rural Development Studies Vol. X No. 1 (2002)

Approach of Rural Development: A Study with Reference to Indore District of Madhya Pradesh

P.C. Sikligar

Abstract

This article reviews some of the programmes which meant for the rural citizens in the context of Indore district of Madhya Pradesh. Based on findings, the author of the article realized that there is still a need to create coordination between elected representatives and office bearers in favour of upliftment of rural people. On the other side, people are also expected to participate actively in the development process of their areas. Similarly, development should be decided based on need of the people. Target group should be given appropriate training in favour of improving their skill. There is a need to create link between training and assets so that people would be able to maintain their livelihood in a sustainable manner. In this process monitoring and evaluation by the concerned agents cannot be kept aside, which is equally important to measure success of the programme.

Introduction

Indore district is situated in the Malva Plateau of Madhya Pradesh which lies between 22° 20' and 23° 5' North Latitude and 75° 25' and 75° 15' East Longitude. The district is surrounded by the districts of Dewas (on the east), **Ujjain (on the north), Dhar (on the west) and Khargone (on the South).** The boundaries of the district remained unchanged since 1911. The district derives its name from the district headquarters town Indore, which was popularly known as 'Indrapur'. The name 'Indrapur' derived from the temple of Indreshwar which was created in the year 1741. Indore is the third district in the Madhya Pradesh in terms of area. The entire district is divided into four Janpads/Talukas, which were known as **Devpalpur, Sawer, Indore, and Mhow.** There are about 304 Gram Panchayats functioning in the whole district. According to 1991 census, about 18,35,915 (1.83

[1] Assistant Director, Centre for Social Development, National Institute of Rural Development, Rajendranagar, Hyderabad - 500 030.

million) population have been recorded which consist of 69.42 per cent of urban and 30.58 per cent of rural areas. Within the population 16.65 per cent and 5.49 per cent were Scheduled Castes and Scheduled Tribes which constitute more than one-fifth of the total population of the district. As far as literacy of the district is concerned, there is a wide gap observed between urban and rural literacy. The urban literacy was recorded 69.43 per cent whereas rural literacy was recorded 30.57 per cent in the same census. The literacy rate of Scheduled Castes and Scheduled Tribes is still lower than rural literacy.

To know about the effectiveness of the programmes especially centrally sponsored, a study was conducted in the month of June, 1998.

Objectives

- To know the coordination between one to other department which are working in favour of upliftment of rural people and their areas;
- To find out the effectiveness of the programmes; and
- To suggest appropriate alternatives for better implementation of the programmes.

Methodology

This study was conducted in five villages such as Panda, Harsola, Jamoi, Dakacchya and Peerkardaiya of Indore district where an interaction was made with the beneficiaries of some of the centrally sponsored programmes mentioned under the next sub-titles. An effort was also made to know the functions of Gram Panchayat.

Programmes which are being Implemented in Indore District

Like other districts of India, many rural development programmes such as Integrated Rural Development Programme (IRDP), Training of Rural Youth for Self-employment (TRYSEM), Development of Women and Children in Rural Areas (DWCRA), Supply of Improved Toolkits to Rural Artisans (SITRA), Ganga Kalyan Yojana (GKY), Million Well Scheme (MWS), Employment Assurance Scheme (EAS), Jawahar Rojgar Yojana (JRY), Watershed (WS), Members of Parliament Local Area Development and National Social Assistance Programmes are being implemented in Indore district. Now all the self-employment programmes like IRDP,TRYSEM, DWCRA, SITRA, GKY and MWS are no longer functioning in a

separate mode. All these programmes covered under **Swarn Jayanti Gram Swarozgar Yojana** since April 1, 1999. Whereas **Jawahar Rozgar Yojana** was renamed as **Jawahar Gram Samridhi Yojana** from above mentioned period. The JGSY now covers all types of village infrastructure. In this regard, the power has been given to Gram Panchayat to attend all types of infrastructural works in village. Now watershed, M.P. Local Area Development, Employment Assurance Scheme, National Social Assistance Programmes, India Awas Yojana, etc., are functioning independently. Apart from these centrally sponsored programmes, many state government's programmes like social security, Vatsalya, Ayusmati, Balika Samardhi Yojana, Dattakputri, Mulbhut Aawsktya, Members of Legislative Assembly, Local Area Development Funds, Scholarship for Handicapped Student etc., are being implemented with other programmes on agriculture, farm, fruit, dairy etc.

Coordination between One to Other Department

Officers of different departments used to assemble on 26th of every month with a view to discussing the banking issues like coverage of target, identification of the new beneficiaries, recovery of loan, progress of programmes. This meeting popularly known as a meeting of **District Link Coordination Committee** (DLCC).

Similarly, Block Level Bankers Committee (BLBC) assemble on the same day to discuss various issues like coverage of target, recovery of loan, action in regard of pending applications, etc. Despite above meetings, the Assistant Development Extension Officers (ADEOs) also meet at Zilla Parishad on 28th of every month. In this meeting, Chief Executive Officer (CEO) Zilla Parishad reviews the progress of whole district with the help of Assistant Extension Officers. There were 40 AEOs posted in all four blocks of the district. The District Rural Development Agency (DRDA), which used to be independent body for implementation of various programmes at district level, merged into Zilla Parishad from 1 October, 1997. Now all types of works are being carried out by the Panchayati Raj Institutions (PRIs). The PRIs are classified into three categories i.e. Zilla Parishad at District level, Janpad at Block level, and Gram Panchayat at Village level. Similarly, many departments like Public Health Centre, Education, Public Distribution System, Agriculture, Veterinary, Cooperatives, Rural Industries, Public Works Department, Education, etc., are working under the Panchayati Raj Institutions. Earlier these departments were working independently with their own budget, target and staff.

Decided by the Panchayati Raj Institutions, all these departments gives priority to such works.

As far as coordination is concerned, it is found that all the departments send their representatives in the above mentioned meetings. All the officers who turn up to the meeting promise to complete their target in time. However, monitoring, supervision and evaluation of the programmes are not paid due attention, which are equally important to measure the success of the programmes.

Findings and Suggestions

Role and Functions of Gram Panchayats

To fulfil the dream of 73rd Constitution (Amendment) Act, 1992 the provision of reservation of Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs) and one-third representation of Women are ensured in all the three tier of Panchayati Raj Institutions (Gram Panchayat, Janpad and Zilla Parishad). In all the study villages separate Gram Panchayat is existent headed by sarpanch. Out of all the five Gram Panchayats, Panda Gram Panchayat was headed by woman sarpanch. In case of woman sarpanch it is found that her husband was actively involved in dealing of Panchayat's work. He used to give necessary information like income and expenditure of Panchayat, completed and on-going works, provision of meetings and output of the organised meeting of Gram Panchayat. This indicates that despite reservation of women in local bodies, the women of rural areas are not participating actively in village development. There are number of reasons such as low level of literacy among the rural women, lack of exposure in political arena, existent of male virtue in the society, looking after the family affairs, etc., prevent women from participating in leadership. That is why women have become a showpiece in the field of leadership where their role is decided only to fulfil the target of reservation.

The same story is prevalent in case of all those women who got elected at Block and Zilla Parishad level too. On the other side, all panch who elected for study villages, do not participate in various activities of Gram Panchayat due to many reasons like lack of exposure in politics, lack of motivation, lack of education, lack of economic subsistence, etc. which prevent them from participating in day to day activities of Gram Panchayat. Majority of the panch have poor economic background which enforce them to manage their livelihood. As a result, they show their inability to participate in the development process of the village. Because of these genuine problems they show lethargic attitude towards attending meetings of Gram Panchayat. The same situation is applicable for the people of the study villages. Due to above mentioned reasons they fail to participate in Gram Sabha even though the Government of Madhya Pradesh have decided to organise Gram Sabhas on the following dates such as 23rd January, 14th April, 20th August and 2nd October of each year. When panch and people do not participate in above separate meetings then

sarpanches are bound to play monopoly in development process and as a result development of village becomes one-sided game.

To avoid such barriers, there is a need to make the concept of Gram Panchayat popular through television and attractive posters. In study villages it is found that majority of the beneficiaries (of different schemes) have got black and white portable televisions. Therefore, television could be made one of the good sources of propaganda for the message of Panchayati Raj system. In the interior villages where television facility is not available, news papers and attractive posters can be made popular there for the message of participating in village development through Gram Panchayat. Besides all the Panchayats who play a significant role in the process of village development should be rewarded with some incentive. In one of the study villages named Peerkaradiya where Gram Panchayat has got Rs. 25,000/- and **Prasansha Patra** for its good work. This system would be helpful for the members of other Gram Panchayats. The Peerkarachiya Gram Panchayat had utilised the same amount in favour of construction of two rooms in Girls Middle School of the village. Similarly, it would be better if the panch of Gram Panchayats had been given honorarium of Rs 300/- every month for creating enthusiasm among them. When the sarpanches are getting honorarium of Rs 500/- pm then there is no harm to pay a little honorarium to this section of the leaders.

Integrated Rural Development Programme (IRDP)

IRDP has covered a good number of beneficiaries by providing assistance to different occupations like dairy, hosiery, tent, vegetables production, grocery, cutlery, pottery, repair of television and radio etc. in the villages of study. In few cases both husband and wife have been covered by providing assets, which are popularly known as **Parivar Shakh Yojana**. However, it is observed that dairy (loan for she buffaloes) is running successfully in the study area, because majority of the beneficiaries of this scheme sells milk in Indore City. Whereas other occupations are not as progressive because of the problems like non-availability of raw materials, marketing and low amount of loan, which make them inefficient to run the occupations smoothly. On the other side, bankers have reduced target capacity because of the problem of recovery. They however stated that recovery from earlier beneficiaries is poorer than the guarantee to recover loan from the new beneficiaries. Besides, the bankers were found interested to sanction loan to those people where they have a good chance of recovery. In this process needy people belonging to

weaker sections particularly Scheduled Castes and Scheduled Tribes have been ignored. Again, almost all families of the study villages have been covered in the list of 'Below Poverty Line' (BPL) through 1st survey. In this process majority of the families have become applicants of IRDP loan. To avoid such malpractice another survey was conducted in 1997 in which only deserving candidates were identified. This survey brought out 26,005 families in the whole district. This survey was conducted based on certain norms like non-ownership of ceiling fan, scooter, motorbike, pucca house, etc., and having yearly income not more than Rs. 11,000.00.

Of course, all the six self-employment programmes like IRDP, TRYSEM, DWCRA, STTRA, GKY and MWS are now covered under Swarn Jayanti Gram Swarozgar Yojana (SGSY) and combined result are awaited. But programme like IRDP which started implementation in the 1980s was in need of many changes for its better performance: loan should have been given to needy and interested people, sufficient amount of loan would have been given to interested beneficiaries, availability of raw materials and marketing of the product, ensurance of quality of product by the beneficiaries and monitoring and evaluation of the programme. Lack of proper attention to all these elements brought about the failure of IRDP.

Training of Rural Youth for Self-Employment (TRYSEM)

Under TRYSEM 35 youths had been benefited through training of lab technician, electrician, plumber, fitter, radio and TV repairs, tailoring, etc. Some of the youths who got training of electrician, plumber, fitter were absorbed in different types of industries which were located in Indore. Whereas, one youth had opened his own shop of TV repair. One major lacuna found in this process is that the trainees had not been tied up with any of the scheme like IRDP under which loan could have been sanctioned to create self-employment for the trained youth. In one of the study villages named Jamli where one trained youth of TRYSEM joined Rajiv Gandhi Education Mission. The same system found in case of Harsola village where about 35 women were given individual sewing machine to generate employment in their village but they were using all the sewing machines for their own domestic purpose. Whereas, all the beneficiaries of each component were given stipend of Rs. 150/- per month during training period which continued up to six months. Majority of the youths stated that they could not concentrate on such occupations (for which they got training) due to various reasons like their quality of production might not be as

good as other industrial units, lack of marketing in rural areas and inclination of rural people towards attractive urban goods. All these factors made them unenthusiastic towards such occupations for which they got training.

Therefore, there was a necessity to link such type of training with any of the self-employment programmes where youths could be given loan to establish their occupation. There should be a provision to take signature on bond under which youths were expected to establish relevant occupations for which they got training. It could have been better if the government took the responsibility of supplying raw materials and marketing of the product. It is felt that the investment for training of youths for different occupations could produce expected result, because majority of the youths had not engaged themselves in those occupations for which they got training.

Indira Awaas Yojana (IAY)

Under IAY the amount of assistance has been increased from RS 9000/- to Rs. 15000/- in case of each beneficiary. All those beneficiaries who were covered before 1996-97 were given an assistance of Rs. 9000/- in three instalments. Whereas, other beneficiaries those who came after 1996-97 were given an assistance of Rs. 15000/- in three instalments. Each instalment was supposed to be released based on some criteria which fulfiled the progress of work like completion of foundation, wall and roof. Majority of the beneficiaries however expressed that it would have been better if the government had released the last installment during construction of house only. They brought to notice that the installment which was released after completion of the work was not required because their work was already completed before the 3rd instalment. Therefore, they emphasised that it could have been better if the last installment had been released during the final shape or plaster time. Moreover, majority of the beneficiaries were not provided with additional facilities such as latrine and chullahs. Whereas, guidelines of IAY indicates that each beneficiary was supposed to get facility of individual latrine with the cost of Rs. 2,300/- (after completion of house). Similarly, the concept of chullah had not been fulfilled. On the other side of this deficiency, allotment of houses had been made in the name of men, which went against the norms of IAY. In this regard, it was told that all the puttas where houses were being constructed were registered in the name of men, which was difficult to transferred in the name of women. Similarly, all the houses were not facilitated with proper road, drinking water, drainage, streetlight,

etc. However, Government of Madhya Pradesh provided one bulb to each beneficiary under **EK-Diya** scheme. This scheme is applicable for all those families which falls under **Below Poverty Line.**

During field visit it was observed that most of housewives were sitting idle in their houses. It is brought to notice that during agriculture season all of them were employed in agricultural fields, but in lean season they used to live without work. Therefore, it would have been better if they had been attached with any of the self-employment programmes for generating income.

Jawahar Rozgar Yojana (JRY)

Under JRY a good number of works like construction of school rooms, C.C roads, boundaries of wells, drainage, kuchha road, morbikaran, sheds on cremation centres, shopping complex, water tank, culvert, boundary of school building, primary health centre, pipeline for supply of drinking water, community hall, etc., had been undertaken in all the study villages. It was reported that all the Gram Panchayats had been getting about 70 per cent of funds directly from Zilla Parishad in the development of the village infrastructure. Fifteen per cent of funds were kept by the Zilla Parishad and the Janpad for administrative, maintenance, monitoring and supervision of the programmes. As far as quality of work is concerned, it was found that drainage had not been maintained in proper way. The morbikaran and kuchha roads did not fulfil the dream of its permanency. Moreover, local labourers were not used in these works. Most of the works were carried out by the local contractors, whereas guidelines of JRY had clearly indicated to use local labourers in the process of attending the works. The concept of people's participation in development was not seen in all the villages under study.

To avoid this, there was a need to use local people in developmental activities. The Panchayats should have involved local people in the above mentioned works, but they had not done it. There was a need to collect 1 per cent contribution from the local people to make them realise that they also contributed and participated in development of infrastructure in their village. This system would have been helpful from supervision point of view. When people contribute something then they keep eyes on the work with the impression that their fund is involved in this process. A few sarpanches however had shown their inability to attend works in allocated fund. They emphasised that due to lack of sufficient fund they failed to bring quality in

work. In this regard, there was a need to mobilise funds from other schemes in favour of one work with durable nature. In other words, funds from different schemes should be put together in favour of one work which had given more durability rather than attending different works with small budget.

To overcome these problems, there was a need to follow **Convergence Model** of development where all resources could have been utilised on the priority of the people with the help of sectoral departments, people and resources. Through Convergence Model, all types of basic needs can be attended one by one.

Development of Women and Children in Rural Areas (DWCRA)

Out of all the five villages, the DWCRA groups (two) were formed only in Jamli village, which consisted of 10 members in each group. Both the groups were formed in 1995-96 with the assistance of Rs. 15,000/- each. Both the groups were producing potato chips, but due to lack of coordination among the members and marketing problem the groups could not continue for a long time. Besides this, production of potato chips was seasonal in nature and as a result the members of the groups dispersed in short duration.

To avoid this problem, there was a necessity to ensure quality of product, marketing and coordination among member. For this type of seasonal product there was a need for storage facility where product could be kept safely and whenever the season started it could be released for marketing. But this system required more amount i.e. cost beyond production. To make success of the DWCRA groups, there was a need for enthusiastic approach among the members with the guarantee of sell. To maintain the spirit of product, it was necessary to organise them at one place.

National Social Assistance Programme (NSAP)

The concept of social security in the state of Madhya Pradesh is as old as in many of the other Indian states. The Government of Madhya Pradesh has started social security and social welfare programmes in 1970. Under this programme pensions have been given to old aged person, destitute widow, handicapped, deserted wives etc. Besides this, Government of Madhya Pradesh also ran a number of welfare programmes in favour of upliftment of weaker sections. From June 1996 onwards old aged persons of the state government have merged into the National Social Assistance Programme where all the aged persons who crossed 50 years and above are covered under the National Old Age Pension Scheme (NOAPS) which is one of

the components of NSAP. Below this category i.e. 58 years of age in case of male and 55 years of age in case of female are supposed to get pension from the state government. During field visit it was found that each beneficiary was getting an assistance of Rs. 150/- pm. with the equal contribution of the centre as well as the state government. Regarding utilisation of this assistance, majority of the beneficiaries stated that the amount of Rs. 150/- pm. was not sufficient to fulfil their day-to-day needs. But to some extent, it gave relief to the beneficiaries. One good quality of this scheme is that all the beneficiaries collect their assistance at Gram Panchayat in the first week of every week, which is not trouble, some for them. In Madhya Pradesh majority of Gram Panchayats cover only one village and so a beneficiary need not go out side the village to collect the assistance. Again, in case if the beneficiary is not able to collect pension under some circumstances, the Gram Sachiv takes care of providing pension at his/her house. About 250 persons have been getting benefit under National Old Age Pension Scheme (NOAPS) every month in the villages under study. Similarly, about 33 women and 8 families have been benefited under the National Maternity Benefit Scheme (NMBS) and National Family Benefit Scheme (NFBS) in all the study villages until June 1998. The assistance of all the three components i.e. NOAPS, NMBS and NFBS got revised in August 1998. Under this, each beneficiary of NMBS was supposed to get Rs. 500/- for one delivery and the same amount up to two deliveries. Whereas the beneficiaries of NFBS were given an assistance of Rs. 10,000/- in case of death of bread winner. The assistance of both the schemes i.e. NMBS and NFBS has been enhanced from Rs. 300/- to Rs. 500/- and Rs. 5000/- to Rs. 10,000/- in case of each beneficiary. As far as delay of assistance is concerned, various reasons were brought to the notice that women did not come out from their house after one month of delivery and death of bread winner. In case of delivery they take rest and nutritious food whereas in case of death of bread winner women do not come out due to the custom of society. They are bound to live in their house up to 30 - 40 days after the death of a breadwinner. Besides lack of knowledge about the scheme, illiterate nature of the needy women as well as lack of support by the family members, no timely verification of the case, lack of vehicle to make visit to the applicants, lack of staff, lack of coordination between departments, lengthy process of application, apathetic attitude of applicants etc., make delay in payment to the beneficiaries. The postal department accepts 50 to 100 money orders in a day, which make delay in payment particularly in case of beneficiaries of NOAPS whose mode of payment is money order. To avoid all these barriers, there is a need to improve the situation in all the above mentioned issues. In addition, Central Government should also release financial allocation in time so that delay can be avoided.

References

Encyclopedic District Gazetteers of India (1977), *North Zone Volume No. 5,* Gyan Publishing House, New Delhi, India.

Ministry of Rural Areas and Employment (1995), *Guidelines for National Social Assistance Programme,* India.

Sikligar, P.C. (2000), *Social Security*, Mangal Deep Publication, Jaipur, India.

Glossary

1.	Gram Panchayat	:	Village Council
2.	Janpad	:	Middle tier of Panchayati Raj Institute which function at block level.
3.	Zilla Parishad	:	District Council which function at district level.
4.	Sarpanch	:	President of Village Council
5.	Panch	:	Members of Village Council
6.	Taluka	:	Headquarters of Revenue Collection
7.	Gram Sachiv	:	Village Secretary
8.	Gram Shaba	:	Meeting of Village Assembly
9.	Scheduled Castes	:	Group of certain caste in Indian Social Structure which provided certain privilege to uplift under the Indian Constitution.
10.	Scheduled Tribes	:	Group of tribal people who live in scheduled areas and provided privilege under Indian Constitution.
11.	Vatsalya	:	Scheme on mother infant relation
12.	Ayusmati	:	Welfare of women for their survival
13.	Balika Samardhi	:	Scheme for prosperity of girl child Yojana
14.	Dattakputri	:	Adoption of girl child.
15.	Mulfhut Aawashaktya	:	Basic Needs
16.	Patta	:	Piece of Land
17.	Parivar Shak Yojana	:	Family Credit Scheme
18.	Prasansha Patra	:	Certificate for better performance
19.	Eke diya	:	One Bulb
20.	Morbikaran	:	Concrete Road

Note : Kindly make a note that now Integrated Rural Development (IRDP), Training of Rural Youth for Self-employment (TRYSEM), Development of Women and Children in Rural Areas (DWCEA), Supply of Improved Tool Kits to the Rural Artisans (SITRA), Ganga Kalyan Yojana (GKY) and Million Well Scheme (MIWS) merged in Swarnjayanti Gram Swarozgar Yojana (SGSY) from April 1999 onwards.

ISSN 1019 - 9624
The Bangladesh Rural Development Studies Vol. X No. 1 (2002)

Modern Rice Technology Adoption in Rainfed Areas and its Impact on the Rural Livelihood Pattern in Bangladesh

M. A Jabber[1]
M. Shahe Alam[2]

Abstract

In order to determine the impact of rapid diffusion of modern rice technologies on income generation and overall livelihood pattern of the rural population, a household survey was conducted during 1996 for three different production environments (favourable rainfed, flood-prone and drought-prone zones) which cover nearly 58% of the country's total cropped area. The sample was drawn from 30 villages representing the three production environments. The farm households were classified into six groups based on the adoption of technology (adopter, non-adopter) and the size of the farm (small, medium and large), and a proportionate random sample of 20 households were drawn from each village. The findings of the study reveal that the net farm income earned by the modern technology adopters is about 39% higher compared to that of the non-adopters. The study further showed that the adoption of modern technology enabled the households to earn a net savings of 10% of the total income while the non-adopter had absolute dis-savings eventually leading to indebtedness. The adoption of modern technology further enabled farmers to improve their livelihood as the per capita consumption expenditure for the adopter households were 17% higher than the non-adopters.

Keywords: Adoption, household income, consumption expenditures, utilization of saving

---

[1] Principal Agricultural Economist, Bangladesh Rice Research Institute, Gazipur- 1701, Bangladesh
[2] Principal Agricultural Economist, Bangladesh Rice Research Institute, Gazipur- 1701, Bangladesh

Introduction

Bangladesh has an arable land area of about 9 million hectares with which the country supports 130 million people. Rice occupies nearly three-fourths of the cropped land. The domestic production of rice is still not sufficient to meet the demand for food which is growing at a rate of 2% per annum.

Although modern rice varieties (MVs) were introduced in Bangladesh in the mid-sixties, but their adoption/diffusion was quite slow during the 1970s. The rapid expansion of MVs took place since 1985 with the expansion of the irrigation facilities particularly through private sector investment on shallow tubewells (Hossain et al, 1994). The available statistics indicate that 62% of the total rice area in Bangladesh is cropped with modern varieties and 48 percent of the rice area is irrigated (BBS, 1999-2000).

The adoption of modern rice technology should have a positive impact on farmers' income and consumption through increase in yield and reduction in the unit cost of production. This study attempts to test this hypothesis. The specific objectives of the study are:

- to analyze the factors behind the adoption of modern rice technology in the study areas;
- to quantify the level of income generated by the farmers from the adoption of modern rice technologies; and
- to assess the impact on consumption, expenditures, savings and investments for different farm household categories.

Methodology

The study was conducted in the areas to represent three different production environments, e.g., favourable rainfed, flood-prone, and drought-prone areas. These environments cover almost 58% of the cropped area of Bangladesh. A total of 30 villages (10 from each environment) were selected for the study. A census was undertaken to enlist all farm household in each village. In all 2520 households were listed (comprising of 1600 small farmers, 720 medium farmers

and 200 large farmers). The farm households were then classified into two groups based on the rate of adoption of modern varieties; high- adopter households who have more than 20% of the rice land under modern varieties, and others being called low-adopters. Each of those groups were then classified into three sub-groups based on the size of landholdings i.e. small (1 ha) medium (1 - 3 ha) and large (>3 ha). A random sample of 25 percent of the farm households were then selected for in-depth interview for generating primary information using a structured questionnaire. The sample consists of 630 households. Descriptive and statistical techniques were used for presentation of findings.

Results And Discussion

Adoption of technology

Land area distribution, crop cultivation and differences in the adoption of modern rice technology for the adopter and non-adopter farmers are presented in Table 1. It can be noted that the adopter households have larger farm size, higher intensity of rice cropping, larger proportion of area under the irrigated boro rice, and substantially higher rate of adoption of modern rice varieties in all three seasons, aus (pre-monsoon), aman (monsoon rice) and boro (dry season). The aman crop is basically grown under rainfed condition. The farmers grew modern varieties in about 48 percent of the aman land. The adoption rate is however substantially higher for the adopter group than for the non-adopters. It indicates that the adopter group are more risk takers while the non-adopter groups are risk averse.

A multivariable regression model was estimated with households level data to analyze the factors influencing the adoption of modern rices. The dependent variable was measured by the percent of rice area cropped with modern rices for the sample farm household. It was hypothesized that the rate of adoption would depend on the availability of irrigation facilities (measured by the percent of cultivated land under modern irrigation facilities), the educational attainment of the farmers (number of years of schooling), the asset position of the farmer (measured by the landholding size) and the endowment of favourable land parcels (well drained land of medium elevation) in the total land portfolio of the farmer. The estimated parameters of the model are reported in Table 2. The value of R^2 shows that nearly 72 percent of the variation in the rate of adoption of

modern rices are explained by the model. The positive and statistically significant coefficient of the land ownership variables suggest that modern rices are adopted more by large landowners relatively than the small owners indicating that the adoption of modern rice is not scale neutral in Bangladesh. This finding is contrary to many earlier studies conducted during 1970s which showed that modern rices were adopted by small and large farmers alike (Hossain 1977; Jabber 1977; Mandal 1980).

It is argued in the literature (Pears, 1980; Griffin 1974) that farmers must be educated to take advantage of the benefits of new technology since it entails new crop management practices which should be understood by the farmers. Those who are better educated can better absorb the new knowledge regarding proper crop establishment methods, appropriate timing and amount of fertilizers to be used, and the pest management methods which will ultimately determine the amount of yield that the farmer would get from the adoption of modern varieties. The educated farmers can also better judge the situation of the input-output market than the illiterate farmers, and hence can get better returns from the additional outputs obtained from the application of the new technology. Thus, the higher the level of education of the farmer, the higher the rate of adoption of the technology. However, the data do not support this hypothesis. The coefficient of education variable is positive though not statistically significant but it has positive impact of the adoption of modern rice production technologies.

The hypothesis that the semi-dwarf modern rices will be adopted more on the well-drained medium level land is also not validated by the data. The coefficient of the variable representing medium level land is positive but not statistically significant.

The access to irrigation facilities is, however, the most important technical factor influencing the adoption of modern rices. The regression coefficient is statistically significant in the equation for all households as well as for the adopter households. Thus within the adopter group, the higher the proportion of irrigated land, the higher the rate of adoption of modern rices. The coefficient for the low-adopter group is statistically insignificant, suggesting that it is their lack

of access to irrigation facilities which contributed to the low rate adoption of modern rices.

The effect on farm incomes

The amount and the composition of household income estimated from survey are reported in Table 3. Almost 60% of the total income for the high-adopter group are derived from the cultivation of modern rices and it is only 17% for the low-adopter group.

The ultimate effect of adoption of modern rices on farm incomes may be assessed from the difference in per capita income between the high-adopter and the low-adopter group. The high-adopter group had a size of holding about 12% higher than the low-adopter group, but their per capita income was higher by nearly about 45 percent. This suggests that the adoption of MVs might have contributed to the increase in household income by nearly one-third.

The impact on consumption expenditure

The information on household expenditures on basic, luxury and crop production items are presented in Table 4. Although the average family size of the high-adopter farmers is smaller compared to that of the low-adopter group, the expenditure on all items of basic necessities (except the medical expenses) is much higher for the farmer compared to latter group. Similar is the case with regard to investment on crop management. The agricultural investment which includes expenditure on seeds, fertilizers, irrigation charges and rental charges for draft power and farm machinery was estimated at US$ 443 for the entire sample, but about 40% larger for the high-adopter groups as compared to the low-adopter group.

The gross margin on income and expenses of the surveyed farms are reported in Table 5. Table 5 shows that, after meeting up all the requirements on basic, luxury items and agricultural production costs, the high-adopter farms had been able to save about $ 132.0 on the average. This increased income as from agricultural surplus might have resulted mainly from the adoption of the new technology in contrast to the low-adopter farmer. This in tern keeps further

investment for accumulation of capital that contributes to the growth in agricultural productivity remain under economic hardship as indicated by the deficit income-expenditure balance. They are often forced to borrow at high-interest rates from local money lenders and are ultimately forced to sell land to clear the debt that further weaken the asset base for agricultural production. Table 6 shows that nearly 70% of the savings for the high-adopters group were utilized for the purchase of land and another 10 percent invested for enlarging the livestock assets. Thus, findings suggest that the adoption of modern rice varieties contributed to strengthening the resource base of the farmer.

Conclusion

The study concludes that, the adoption of modern rice production technology enhanced the farm households' net farm income. Further, the adoption of the technology contributes to the generation of agricultural surplus after meeting all of their basic necessities and agricultural expenses. The adopter households were able to save 10% of their total income earned through different sources. Despite the fact that the low adopter households have almost similar resource endowments, but they are lagging behind in the adoption of the new technology because of their traditional attitude belief and lack of access to irrigation-facilities. Therefore, this study suggests that there is ample scope to expedite the adoption of modern rice production technology through strengthening motivational activities at the farm level.

Table 1. Land area distribution and crop cultivation practices by the sample households in different seasons in Bangladesh, 1996.

Land utilization pattern	Farm groups		All
	Progressive	Less progressive	
Average farm size (ha)	1.11	0.98	1.04
Average rice area by season/household:			
Aman[a]	1.05	0.84	0.94
Boro[b]	0.45	0.07	0.26
Aus[c]	0.32	0.29	0.31
Total rice area (ha)	1.82	1.20	1.51
Total area planted in the season(ha):			
Aman	340.20 (97)	289.80 (94)	315.00 (96)
Boro	173.25 (50)	66.15 (21)	119.70 (36)
Aus	119.70 (34)	144.90 (47)	132.30 (40)
Area planted by variety (%):			
Aman:			
Modern varieties (MVs)	68.52	19.02	43.77
Local varieties (LVs)	28.70	72.29	50.50
Others crops	2.78	8.69	5.73
Boro:			
MV	80.91	18.57	49.74
LV	0.91	15.71	8.31
Other crops	18.18	65.72	41.95
Aus:			
MV	39.47	17.39	28.43
LV	44.74	45.65	45.20
Other crops	15.79	36.96	26.37

Figures in the parentheses are the percentages

[a] Wet season rice [b] Irrigated winter season rice [c] Pre- monsoon/ dry season rice

Table 2. Determinants of adoption of modern rice technology in the study areas, Bangladesh, 1996.

Independent variables (Parameters)	Regression coefficients		
	High Adopter Farmers	Low Adopter Farmers	All
Irrigation availability	0.7823**	0.5368	0.6841**
Education	0.4619	0.3452	0.3983
Ownership of land	0.6953**	0.73**	0.7111**
Rice income from previous year	0.8436*	0.3111	0.7209**
Land type	0.4431	0.3633	0.8344
R^2	0.85	0.59	0.7216

* Significant at 1% level ** Significant at 5% level

Table 3. Structure of farm household income generation from agriculture and non agriculture sources in Bangladesh, 1996.

Sources of Income	Farm groups (Income)				All (US$)	% of income
	Adopter household		Non-adopter household			
	Progressive (US$)	% of income	Less progressive (US$)	% of income		
A. Agriculture						
Crop cultivation:						
MV rice	788.36	59.88	163.39	17.19	475.88	41.98
LV rice	162.46	12.34	329.71	34.69	246.08	21.71
Non-rice	48.78	3.71	133.71	14.07	91.24	8.05
Wages	13.04	0.99	43.18	4.54	28.11	2.50
Non-crop activities	51.14	3.88	49.86	5.25	50.50	4.45
B. Non-Agriculture						
Trade, transport, construction and industry	181.77	13.80	160.55	16.90	171.16	15.10
Services and remittances	71.11	5.40	69.93	7.36	70.52	6.21
Total household income	1316.66	100	950.33	100	1133.49	100
Per capita income	231.28		160.53		195.43	

Per hectare income of progressive farmers in Aman season for MV rice $592.42 and LV rice $390.25
Per hectare income of less progressive farmers in Aman season for MV rice $525.16 and LV rice $331.74
Per hectare income of progressive farmers in Boro season for MV rice $721.75 and LV rice $402.84
Per hectare income of less progressive farmers in Boro season for MV rice $668.46 and LV rice $371.34
Per hectare income of progressive farmers in Aus season for MV rice $528.58 and LV rice $231.34
Per hectare income of less progressive farmers in Aus season for MV rice $442.71 and LV rice $215.92

Table 4. Household routine expenditure structure on basic, luxury and crop production items in the study areas, Bangladesh, 1996.

(US$/Family)

Expenditure Items	Farm groups		All
	Progressive	Less progressive	
A. Basic necessities			
Food [1/]	468.17	458.96	463.56
Clothing	30.23	25.34	27.78
Education	50.17	39.28	44.73
Medical	18.18	27.31	22.74
Housing	19.64	17.84	18.74
Electricity and fuel	30.15	26.39	28.26
Sub-Total	**616.54**	**595.12**	**605.81**
B. Luxury [2/]	**50.82**	**44.21**	47.51
C. Agricultural investmnet	517.63	369.56	443.59
Grand Total (A + B+ C)	**1184.99**	**1008.89**	**1096.91**

[1/] This includes rice, wheat, meat, fish, pulses, vegetables, fruits, sweets, and spices
[2/] This includes expenses incurred on festivals, furniture, Radio, TV, Watch, bicycle etc.

Table 5. Income-expenditure balance for progressive and less progressive households in the study areas, Bangladesh, 1996.

Items	Farm groups		All
	Progressive (US$)	Less progressive (US$)	
Household income	1316.66	950.33	1133.49
Gross expenditure:			
Basic, luxury and agricultural items/household	1184.99	1008.89	1096.99
Surplus or Deficit/household	+131.67	-58.56	36.55

Table 6. Agricultural & non-agricultural investment scenario of the farm households by progressive and less-progressive farm categories, Bangladesh, 1996.

Investment areas	Farm groups		
	Progressive (US$)	% of total investment	Less progressive (US$)
Investment for land purchase	80.84	70.20	-
Cash investment for cattle	10.56	9.17	-
New construction for home development	18.70	16.24	-
Agricultural equipment	5.05	4.39	
Total	**115.15**	**100**	-

References

BBS (1999), *Statistical Pocket Book of Bangladesh*, Statistics Division, Ministry of Planning, Government of the Peoples Republic of Bangladesh, Dhaka.

Griffin, K.B.(1974), *The Political Economy of Agrarian Change: An Essay on the Green Revolution, Cambridge*, Mass: Harvard University Press.

Hossain, M., M. A., Quasem, M. A., Jabber, and M.M., Akash (1994), *Production Environments, Modern Variety Adoption and Income Distribution in Bangladesh,* In David C.C., and K. Otsuka, (eds), Modern Rice Technology and Income Distribution in Asia, Boulder and London: Lynne Rienner Publishers.

Hossain, M. (1977), *Farm Size, Technology and Land Productivity: An Analysis of Farm level Data in Bangladesh Agriculture*, Bangladesh Development Studies, Vol. 5(1).

Jabber, M . A. (1977), *Relative Production Efficiency of Different Tenure Classes in Selected Areas of Bangladesh*, Bangladesh Development Studies, Vol.5(1).

Jabber, M. A. and Hossain, Mukarram (1987), *Impact of Modern Rice Technology on Farmers Income Consumption Savings- A case study of Gazipur, Farm Economy,* The Journal of Bangladesh Agricultural Economics Association.

ISSN 1019 - 9624
The Bangladesh Rural Development Studies Vol. X No. 1 (2002)

Socio Economic Impact of Raising Poultry Under Micro Credit Programme of BRAC

M. K. Hasan[1]
M.M. Alam[2]

Abstract

This paper has made an attempt to explore mainly the impact on poultry production under Micro-Credit Programme of Bangladesh Rural Advancement Committee (BRAC) on the family income. The findings from Smallholder Livestock Development Programme (SLDP) of BRAC reveal that both production and income of the farm families have increased substantially. The living standard of the family has improved and the social status of women has gone up.

Introduction

There are 16.40 million households in Bangladesh, out of which 13.80 million are rural based. Of the total of 8.42 million hectares of cultivable land, approximately 0.45 million hectares or 5 percent are homestead land (B.B.S.1986).

More than 60 percent of people in our country are landless. They can easily produce and improve their financial conditions by raising poultry birds in their homestead land. Poultry farming unlike crop are not seasonal, poultry have a shorter life cycle and its production requires less capital and land. Furthermore, it generates income through-out the year.

The specific production of homestead poultry may be visualized in terms of poverty alleviation, provision of employment to rural women and attempt to improve the problem of malnutrition and gender issues by generating

[1] Scientific Officers, Spices Research Center of Bangladesh Agricultural Research Institute.
[2] Scientific Officers, Spices Research Center of Bangladesh Agricultural Research Institute.

opportunities particularly to poor womenfolk to earn extra income from their self- employment within the homestead premises.

In the male dominated society of Bangladesh the women in both rural and urban area occupy status, which is generally such inferior to that of men. In all spheres of social and economic activities such as education, employment and work, health and nutrition, politics and even in life within the family, women enjoy very limited opportunities.

In respect of women's involvement in Income Generating Activities (IGAs) it was found that almost all women were engaged in IGAs either cash or expenditure savings activities. However, their activities are mostly traditional in nature (poultry rearing, vegetable programme, gardening etc.). As regards to women's contribution to total family income the study revealed that the proportion of household income contributed by them was often higher, though the amount was meager in absolute terms. (Kabir N.N 1996).

Comprising almost half of the world's population, women form a veritable human resources base. In reality, however, inequality in the status between men and women has stood in the way of society's granting recognition to women, which resulted in the denial of opportunities for them and the utilization of their potentialities for the community's welfare. Women have been subordinate to men almost always and everywhere though they seem to have recognized and protested that situation in some form or other (Chafetz and Dworking, 1986, cited in Ritzer, 1986 p-403.).

Not only their movement is restricted within a prescribed space, but adverse in their effect of a clearly and rigidly define allocation of gender based responsibilities in there, resulting into the general powerless of women, even though the contribution of women to their families through their economic activities, which are deliberately ignored or kept invisible by men, is substantial. This subordinate position is further reinforced through various kinds of religion believes and cultural practices. The pattern of training imparted to a female child in Bangladesh emphasizes her subordinate role within the household (Aziz 1989).

For improving the status of women, a number of measures by the Government as well as voluntary or Non-Government Organizations, have been taken in Bangladesh (Duza, 1989).

The Grameen Bank and BRDB provides a notable illustration. Thousands of women, therefore, have been organized into formal or informal groups and they are being provided training, credit and extension services for upliftment of their status and improves their standard of living.

Rural women are better savers and their credit repayment behavior is better. But lack of appropriate management capability, low rate of literacy and poor health and nutritional status of women and their children are obstacles to the way of rapid socio-economic progress of women (Kabir N.N.1996).

A large number of studies on women were also raised directly out of project reports mainly to find out the impact, achievement/progress of their activities according to their goals, objectives, monitoring and policy planing. Noman, A (1983) in her study pointed out that unless the status of women is raised and given due importance the population policy is likely to be frustrated. She examined the issue from the stand point of social, economical, educational and legal aspects but did not see the impact of development projects on fertility control and women's status. Schaffer (1986), Kabir, M and et al (1989) saw the positive effects of development projects in raising women's income, and participation in family decision.

Kabir, M and et al (1993) in their study investigated the impact of development projects on women. They examined 10 NGO's activities and identified the success or failure of the projects and factors effecting to it.

B. Asma and C. Krishna in their study have sought to critically examine the proposition that in a subsistence family, if the women also makes economic contribution, which is visible because of earning from some activity not connected with what is considered part of household chores and considered effective, towards running the family, she would, accordingly, enjoy relatively more power in terms of decision making within her family in comparison with the women who does not make such a contribution.

Rahman M. H. showed in his study homestead agro-forestry farms have earned substantial income and production gains. The women of the households gained in terms of higher social status. The gender status in particular has improved significantly on these households as evidence by the increased participating of homestead agro-forestry practicing women in taking decision on crucial socio-economic and matters in homelands.

Bangladesh Rural Advancement Committee (BRAC) has taken various intensive development programme through some activities for the development of resource poor women. Smallholder Livestock Development Programme (SLDP) is such programmes of BRAC that will help to contribute in makeing some socio economic impact on participating farm families.

Objectives of the Study

- To assess the impact of poultry rearing on the income of the participating families.
- To see the socio-economic changes specially in terms of social status of women.

General Description of Smallholder Livestock Development Programme (SLDP) of BRAC

The Smallholder Livestock Development Programme (SLDP) of BRAC was established on 12th August of 1993. There are 66 thanas in 11 districts of Bangladesh where SLDP started working.

Separate societies are organized for women under the title of BRAC Somity for those families who are landless or nearly landless owning land, less than 50 decimal and who earns income mainly as a day labour. The main goals of the programme are:

1. To develop the rural poultry.
2. To assist rural women to improve their social and economic quality of life through creating self-employment opportunities for them.
3. To implement the suitable technology of poultry rearing to the rural poor.

In this point of view SLDP of BRAC provides loan to the members of the BRAC Somity for poultry rearing. BRAC divides its members into six cadre groups.

a) Key Rearer (b) Model Rearer (c) Chick Rearer (d) Mini Hatcherer (e) Poultry Worker and (f) Feed Seller.

Key Rearer

In the farm of Key Rearer there will be 8 to 10 exogenous and some indigenous poultry birds. They prefer to rear poultry in scavenging condition. Poultry birds are reared for meat and egg production.

Model Rearer

For Model Rearer 25-30 exogenous breed of poultry birds are supplied by BRAC and birds are kept in the chicken house. In this method, farmers rear poultry mainly for the production of eggs for hatching purpose. Most of the eggs are sold to the Mini Hatcherers.

Chick Rearer

In the farm of Chick Rearer the farmers purchase 250 to 300 number of day-old-chicks from Mini Hatcherers. They rear it 2 months by scientific way. They sell two months pullet to the Key and Model Rearer.

Mini Hatcherer

They purchase fertile eggs from the Model Rearers and hatching by rice husk. They hatch only exogenous breed of eggs and sell day-old-chicks to the Chick Rearer.

Feed Seller

Feed Sellers collect all items of balanced feed from the village market in cheap rate. After collection of all items of feed, they are mixed up to make it balanced ration.

Poultry Worker

Poultry Workers are the preliminary doctors of BRAC. They collect vaccine and medicine from BRAC office and then go to the village for vaccination. The

villagers pay cash money or goods for giving vaccination and medicine. For the vaccination Tk. 0.50 is charged for adult poultry and that of chicken it is Tk. 0.25.

After the registration for membership of SLDP of BRAC all cadre group of members have provision to get training for 18 days by BRAC.

Loan Distribution System of BRAC Somity

BRAC Somity sanctions loan amounting to Tk. 1000.00 and Tk. 3000.00 to the Key and Model Rearer and it is repaid by Tk. 15.00 and Tk. 35.00 as per instalment through 75 and 100 instalments respectively. Chick Rearer, Mini Hatcherer and Feed Seller also get the amount of loan of Tk. 6000.00 from the BRAC Somity and it is repaid through 100 instalments amounting to Tk. 70.00 per instalment.

Poultry Workers do not get loan from BRAC Somity. If a Poultry Worker wants to rear poultry as a Key Rearer, she gets loan.

Methodology and Sources of Data

Selection of the Study Area

To achieve the objective of the present study a preliminary survey was conducted in 10 villages under the project areas of BRAC in Mirpur Thana of Kushtia district to understand the broad socio-economic characteristics of the area. On the basis of the preliminary information, finally 8 villages of Mirpur Thana were selected of the study area. Villages are (1) Mirpur Shekpara (2) Noapara (3) Fulbaria (4) Goabari (5) Chithalia (6) Shamukhia (7) Naoda Shamukhia and (8) Rana Kharia.

Collection and Analysis of Data

Data were collected through several visits during the month of June 1995 to July 1996. The basic criterion for selecting a sample was the respondents must have the four categories of farmers and the age of family membership would be at least one year. Fifty samples of poor members were selected randomly of which 20 from Key Rearer, 10 from Model Rearer, 10 from Chick Rearer and 10 from Mini Hatcherer who fulfilled this above criterion. The owners of these poultry

farms were interviewed for collecting necessary information using structured questionnaire.

Tabular and simple statistical tools such as mean, ratio and percentage techniques were used for the analysis of data. Profit or net return was calculated through the subtraction of total cost from the gross return.

Analysis of the Results

The focus of this section is to explore and identify income generation by land less poor women and the impact of income in their family.

Costs and Returns of Raising Poultry

This research took into account four categories of poultry production by participant farm families. These were Key Rearer, Model Rearar,Chick Rearer and Mini Hatcharer.

Table -1. Costs and Returns of Raising Poultry

(Tk/farm/year)

Particulars	Categories of Farmer.			
	Key Rearer	Model Rearer	Chick Rearer	Mini Hatcherer.
Gross Returns	6,533.25	17,158.40	42,996.50	92,611.20
Total Cost	1,367.65	6,259.13	24,558.76	46,703.75
Net Return	5,165.60	10,899.27	18,437.74	45,907.45
Benefit Cost Ratio	4.78	2.74	1.75	1.98

Source: Field survey, 1995-96

Table-1 shows that the participant family of SLDP under BRAC as a Key Rearer, Model Rearer, Chick Rearer and Mini Hatcherer respectively per year contribute Tk. 5,165.60, Tk. 10,899.27, Tk. 18,437.74 and Tk. 45,907.45 to their family for expenditure purpose. As a result of contribution of women in their family there were tremendous change in literacy rate, land ownership and tenure, number of livestock, number of house, food consumption, annual income and expenditure, employment and dependency status.

Table-2. Percentage Distribution of Changes in Literacy Rate According to the Categories of Farmers.

Categories of Farmer.	Education level								
	Illiterate (No.)			Up to Primary (No.)			Above Primary Level to Higher Secondary Level (No.)		
	Before	Present	Change	Before	Present	Change	Before	Present	Change
Key Rearer	3.30	2.60	-0.70 (-21.21)	1.15	1.70	0.55 (47.83)	0.60	0.75	0.15 (25.00)
Model Rearer	3.30	2.90	-0.40 (-12.12)	1.20	1.80	0.60 (50.00)	0.30	0.40	0.10 (33.33)
Chick Rearer	4.20	3.10	-1.11 (-26.19)	1.60	2.50	0.90 (56.25)	0.60	0.80	0.20 (33.33)
Mini Hatcherer	3.20	2.00	-1.20 (-37.50)	1.20	2.00	0.80 (66.67)	0.50	0.90	0.40 (80.00)
All Average	3.58	2.65	-0.93 (-25.98)	1.29	2.00	0.71 (55.23)	0.50	0.71	0.21 (42.50)

Note: Figure in the parenthesis indicates the percentage.
Source: Field Survey, 1995-96.

Remarkable changes of literacy were observed in the family of Key Rearer, Model Rearer, Chick Reare and Mini Hatcherer after initiation of SLDP of BRAC. Illiteracy rate has been decreased by 25.98 percent in all categories of farmer. On the other hand due to positive change in income and education programme of BRAC, literacy rate had been increased up to primary level 55.23 percent and above primary to higher secondary 42.50 percent respectively (Table-2).

Table 3. Change in Land Ownership and Tenure Arrangement for Sample Farmers (In decimal).

Category of Farmers	Category of Lands								
	Homestead land			Own cultivable land			Rented in and mortgaged in land		
	Before	Present	Change	Before	Present	Change	Before	Present	Change
Key Rearer	8.00	8.80	0.80 (10.00)	-	-	-	4.50	11.55	7.05 (176.67)
Model Rearer	7.57	8.90	1.33 (17.57)	-	-	-	5.30	13.30	8.00 (150.94)
Chick Rearer	5.00	7.70	2.70 (54.00)	0.50	2.00	1.50 (300.00)	7.10	16.30	9.20 (129.58)
Mini Hatcherer	8.50	13.80	5.30 (62.00)	0.80	0.60	5.80 (725.00)	7.70	22.90	15.20 (197.40)
All Average	7.27	9.80	2.53 (35.89)	0.33	2.15	1.83 (256.25)	6.15	16.01	9.86 (158.65)

Note: Figure in the parenthesis indicates the percentage.
Source: Field Survey, 1995-96.

The members of SLDP of BRAC were able to create positive change in their land ownership and tenure according to their expectation. They changed in homestead land, own cultivable land and rented in and mortgaged in land. They increased in

homestead land by 35.89 percent, own cultivable land by 256.25 percent and rented in and mortgaged in land by 158.65 percent respectively. For earning lower income, Key and Model Rearer could not able to purchase cultivable land. On the otherhand, they were able to great change in rented in and mortgaged in land (Table-3).

Table-4. Change in Number of Livestock of BRAC Farmers.

Category of Farmers	Category of Livestock							
	Goat				Cattle			
	Before	Present	Change		Before	Present	Change	
Key Rearer	0.75	2.00	1.25	(166.67)	0.05	0.35	0.30	(600.00)
Model Rearer	0.60	1.50	0.90	(150.00)	0.20	0.50	0.30	(150.00)
Chick Rearer	1.30	1.70	0.40	(30.70)	0.20	1.10	0.90	(450.00)
Mini Hatcherer	1.30	2.00	0.70	(53.85)	0.30	1.40	1.10	(366.67)
All Average	0.99	1.80	0.81	(81.82)	0.19	0.84	0.65	(342.11)

Note: Figure in the parenthesis indicates the percentage.
Source: Field Survey, 1995-96.

The farmers of poor land was initiated to purchase livestock animal due to receiving extra income. All livestock resources were reported to have increased after becoming the member of BRAC. In all average, the farmer increased goat 81.82 percent and cattle 342.11 percent (Table-4).

Major points for contributors:

1. The Academy welcomes original articles based on the field experience/data in the field of rural development.
2. The views expressed in the published articles are those of the authors and the Rural Development Academy will not accept any responsibility in this regard.
3. The copyright in all the articles published in the journal is vested in the Rural Development Academy, Bogra. The authors of the published articles will not be allowed to publish the same elsewhere without prior permission of the Academy.
4. The Journal will not usually publish articles in excess of 8000 words.
5. The article should be preceded by a summary which should be a maximum length of 200 words.
6. The published articles may be used as reference materials in other original writings with due acknowledgement and no permission is required in this regard.
7. Each contributor to the journal will be provided with two copies of the concerned issue free of charge.
8. The articles can be either in Bangla or in English. However, mixture of both Bangla and English in the same paper will not normally be acceptable except on special grounds.
9. Four copies of manuscripts typed clearly and double spaced with margin in four sides of the paper should be submitted for consideration of Editorial Board. Diagrams and figures should be used when absolutely necessary and done on black ink.
10. Manuscripts should be submitted to:
    The Executive Editor
    Bangladesh Rural Development Studies
    Rural Development Academy, Bogra
    Bogra-5842, Bangladesh.

Table-5. Change in Number of House According to Farmers.

Category of Farmers	Types of Houses											
	Straw Shed			Tin/Tally Shed			Bamboo Door			Wooden Door		
	Before	Present	Change	Before	Present	Change	Before	Present	Change	Before	Present	Change
Key Rearer	2.30	2.15	-0.15 (-6.52)	0.20	0.70	0.50 (250.00)	1.60	0.40	-1.20 (-75.00)	0.90	2.45	1.55 (172.20)
Model Rearer	2.10	2.20	0.10 (4.76)	0.20	0.80	0.60 (300.00)	1.50	1.20	-0.30 (-20.00)	0.80	1.80	1.00 (125.00)
Chick Rearer	2.50	2.00	-0.50 (-20.00)	0.20	1.00	0.80 (400.00)	1.50	0.60	-0.90 (-60.00)	1.20	2.40	1.20 (100.00)
Mini Hatcherer	2.40	2.10	-0.30 (-12.50)	0.30	1.10	0.80 (266.50)	1.60	1.00	-0.60 (-37.50)	1.10	2.50	1.40 (127.30)
All Average	2.33	2.11	-0.22 (-9.44)	0.23	0.90	0.67 (291.30)	1.55	0.80	-0.75 (48.39)	1.10	2.29	1.19 (108.18)

Note: Figure in the parenthesis indicates the percentage.
Source: Field Survey, 1995-96

Man wants to increase their standard of living. After the membership of BRAC, for receiving additional income in their family they changed their life style and number of houses. Table-5 shows that except Model Rearer all categories of farmers decreased their straw shed houses by 9.44 percent but all farmers increased tin/tally shed houses by 291.30 percent respectively. Table also shows all types of farmers decreased bamboo door but increased wooden door.

Table-6.1. Annual Change in Food Consumption of Sample Farm Household.

Category of Farmers	Food consumption											
	Egg Consumption			Poultry Consumption			Meat Consumption			Fish Consumption		
	Before	Present	Change	Before	Present	Change	Before	Present	Change	Before	Present	Change
Key Rearer	62.25	137.00	74.75 (120.08)	4.45	6.55	2.10 (47.19)	6.10	10.25	4.15 (68.03)	29.80	81.90	52.10 (174.83)
Model Rearer	65.10	301.20	236.10 (362.67)	5.00	8.40	3.40 (68.00)	6.90	15.69	8.70 (127.54)	28.80	90.50	61.70 (214.24)
Chick Rearer	63.20	291.00	227.80 (360.44)	5.50	7.80	2.30 (41.82)	6.70	16.00	9.30 (138.81)	29.60	90.50	60.90 (205.74)
Mini Hatcherer	61.30	327.60	266.30 (434.42)	4.60	16.00	11.40 (247.83)	7.70	22.29	14.59 (189.48)	29.50	129.20	99.70 (337.97)
All Average	62.96	264.20	201.24 (319.63)	4.89	9.69	4.80 (98.16)	6.85	16.04	9.19 (134.09)	29.43	98.03	68.60 (233.10)

Note: Figure in the parenthesis indicates the percentage.

Source: Field Survey, 1995-96

Table-6.2. Annual Change in Food Consumption of Sample Farm Household.

Category of Farmers	Food Consumption								
	Milk Consumption (In Liter)			Vegetables Consumption (In Meal)			Rice/Flour Consumption (In Kg)		
	Before	Present	Change	Before	Present	Change	Before	Present	Change
Key Rearer	3.60	6.80	3.20 (88.89)	438.50	408.40	-30.10 (-6.86)	818.45	1034.40	215.95 (26.39)
Model Rearer	4.30	10.10	5.80 (134.88)	475.50	445.00	-30.50 (-6.41)	758.38	949.51	191.13 (25.20)
Chick Rearer	4.40	10.20	5.80 (131.82)	475.00	448.70	-26.30 (-5.54)	867.50	1067.60	200.10 (23.07)
Mini Hatcherer	4.10	23.30	19.20 (468.29)	450.20	340.40	-109.80 (-24.39)	688.93	960.41	271.48 (39.41)
All Average	4.10	12.60	8.50 (207.32)	459.80	410.63	-49.18 (-10.18)	783.32	1002.98	219.66 (28.04)

Note: Figure in the parenthesis indicates the percentage.

Source: Field Survey, 1995-199

Table-7. Change in Annual Income According to the Category of Farmers.

Sources of income	Category of Farmers														
	Key Rearer			Model Rearer			Chick Rearer			Mini Hatcherer			All Average		
	Before	Present	Change	Before	Present	Change	Before	Present	Change	Before	Present	Change	Before	Present	Change
Day Labour	10745.00	6625.00	-4120.00 (-38.43)	10755.0	6396.00	-4359.00 (-40.53)	9710.00	4080.00	-5630.00 (-57.98)	11350.00	2025.00	-9325.00 (-82.16)	10640.00	4781.50	-5858.50 (-55.06)
Agriculture	300.00	1655.00	1355.00 (451.67)	350.00	1020.00	670.00 (191.43)	400.00	1800.00	1400.00 (350.00)	400.00	2410.00	2010.00 (502.50)	362.50	1721.25	1358.75 (374.83)
Petty Business	3310.00	10250.00	6940.00 (209.67)	4080.00	12537.50	8457.50 (207.29)	2480.00	9830.00	7350.00 (296.37)	2425.00	8380.00	5955.00 245.57)	3073.75	10249.38	7255.63 (233.45)
Rickshaw/Van Pulling	90.00	3375.00	3285.00 (3650.00)	600.00	2700.00	2100.00 (350.00)	1200.00	7670.00	6470.00 (539.17)	650.00	4510.00	3860.00 (593.85)	635.00	4563.00	3728.75 (618.70)
Livestock (Except Poultry)	225.00	630.00	405.00 (180.00)	50.00	300.00	250.00 (500.000	200.00	600.00	400.00 (200.00)	200.00	600.00	400.00 (200.00)	168.75	532.50	363.75 (215.56)
Fishing	225.00	150.00	-75.00 (-33.33)	300.00	200.00	-100.00 (-33.330	200.00	500.00	300.00 (150.00)	300.00	-	300.00 (-100.00)	256.25	212.50	-43.75 (-17.07)
Poultry Rearing	1200.00	5165.60	3965.60 (330.47)	1500.00	10899.27	9399.27(625.62)	2200.00	18437.74	16237.74 (738.08)	2400.00	45907.45	43507.45 (1812.81)	1825.00	20102.52	18277.52 (1001.51)
Other	1430.00	1200.00	-230.00 (-16.08)	1400.00	1267.10	-132.90 (-9.49)	1201.00	1256.75	55.75 (4.64)	1200.00	1300.00	100.00 (8.33)	1307.75	1255.96	-51.79 (-3.96)
Total	17525.00	29050.00	11525.60 (6.58)	19035.00	35319.87	16284.87 (85.55)	17591.00	44174.49	26583.49 (151.12)	18925.00	65132.45	46207.45 (244.16)	18269.00	43419.35	25150.35 (137.67)

Note: Figure in the parenthesis indicates the percentage.

Source: Field Survey, 1995-96

It is observed from the study, except vegetables over all food consumption increased for each of the sample farm household after their involvement with SLDP. The farmers decreased the consumption of vegetables by 10.18 percent. On the otherhand, egg, poultry meat, meat (beef and goat), fish, milk and rice/flour consumption was increased by 319.63, 98.16, 134.09, 233.10, 207.32, and 28.04 percent respectively (Table 6.1 and 6.2).

Main sources of income of Key Rearer, Model Rearer, Chick Rearer and Mini Hatcherer were day labour, agriculture, petty business, rickshaw/van pulling, livestock rearing (except poultry), fishing, poultry rearing and other. Due to positive change in income of the farm family the mentality and standard of living of the family members were changed positively. As a result they gave up profession as a day labourer and fishing and they took profession in agriculture, petty business, rickshaw/ van pulling and poultry rearing. Table-7 reveals that income from day labourer and fishing decreased by 55.06 and 17.09 percent respectively. On the otherhand, income from agriculture, petty business, rickshaw/van pulling, livestock and poultry rearing increased by 374.83, 233.45, 618.70, 215.56, and 1001.50 percent respectively.

The indicators namely food, clothing, housing, medicare, education, land purchasing, land leasing, dowry, animal purchasing, savings and other activities, related with expenditure pattern were used to highlight the change of socio-economic status of the sample house hold. Table-8 reveals that the expenditure on food, clothing, housing, medicare and education increased in all categories of farm families and the percentages of increase were 41.18, 43.49, 458.70, 90.33 and 88.36 respectively. Except Key and Model Rearer, rest of farmers purchased land after the membership of BRAC. The table also indicates that the farmers could be able to increase in the expenditure of dowry, purchase animal, savings and other expenditure by 119.67, 475.16,461.19 and 112.97 percent respectively.

Table-8. Annual Change in Expenditure According to the Category of Farmers.

Sources of income	Category of farmers.														
	Key Rearer			Model Rearer			Chick Rearer			Mini Hatcherer			All Average		
	Before	Present	Change	Before	Present	Change	Before	Present	Change	Before	Present	Change	Before	Present	Change
Food	12176.00	14600.00	2424.00 (19.91)	12316.70	15931.70	3615.05 (29.35)	12240.00	18500.00	6260.00 (51.14)	12392.20	20324.00	7931.80 (64.01)	12281.23	17338.93	5057.70 (41.18)
Cloths	1450.00	1809.00	359.00 (24.76)	1460.00	1920.00	460.00 (31.51)	1430.00	2220.00	810.00 (57.45)	1394.10	2250.00	855.90 (61.39)	1428.53	2049.75	621.22 (43.49)
Housing	700.00	1865.00	1165.00 (166.43)	730.00	3080.00	2350.00(321.92)	980.00	3560.00	2580.00 (263.27)	750.00	9150.00	8400.00 (1120.00)	790.00	4413.75	3623.75 (458.70)
Medicare	350.00	625.00	275.00 (78.75)	400.00	940.00	540.00 (135.00)	350.00	800.00	450.00 (128.57)	710.00	1080.00	370.00 (52.11)	452.50	861.25	408.75 (90.33)
Education	300.00	650.00	350.00 (116.67)	430.00	750.00	320.00 (74.42)	400.00	775.00	375.00 (93.75)	460.00	820.00	360.00 (78.26)	397.50	748.75	351.25 (88.36)
Purchase of Land	-	-	-	-	1500.00	1500.00 (α)	-	1506.88	1506.88 (α)	-	5000.00	5000.00 (α)	-	2001.72	2001.72 (α)
Leasing of Land	-	1540.93	1540.93 (α)	-	3300.00	3300.00(α)	-	3300.00	33.00 (α)	-	6120.00	61120.00 (α)	-	3565.23	3565.23 (α)
Dowry	800.00	900.00	100.00 (12.50)	900.00	1000.00	100.00 (11.11)	850.00	2000.00	1150.00 (135.29)	500.00	2800.00	2300.00 (460.00)	762.50	1675.00	912.50 (119.67)
Purchase Animal	505.00	1010.00	505.00 (100.00)	800.00	3250.00	2450.00 (306.25)	400.00	3850.00	3450.00 (862.50)	590.00	5090.00	4500.00 (762.71)	573.75	3300.00	2726.25 (475.16)
Savings	744.00	850.67	106.67 (14.34)	1198.30	1893.31	695.01 (58.00)	311.00	6151.61	5840.61 (1878.01)	1128.00	10080.10	8952.10 (793.63)	845.33	4743.92	3893.59 (461.19)
Others	500.00	600.00	100.00 (20.00)	800.00	1754.81	954.81 (119.35)	650.00	1511.00	861.00 (132.45)	1000.75	2418.35	1417.65 (1414.67)	737.69	1571.04	833.35 (112.97)
Total	17525.00	24450.60	6925.60 (39.51)	19035.00	35319.87	16284.87 (85.55)	17591.00	44174.49	26583.49 (151.12)	18925.00	65132.45	46207.45 (244.16)	18269.00	42269.35	24000.33 (131.37)

α= Indicates great change.

Note: Figure in the parenthesis indicates the percentage.

Source: Field Survey, 1995-96

Table-9.1. Change in Employment and Dependency Status of the Different Category of Farmers.

Category of Farmers	Total Family Member	Occupation											
		Day Labour			Agriculture			Rickshaw/Van Pulling			Petty Business		
		Before	present	change	Before	present	change	Before	present	change	Before	present	change
Key Rearer	101	22	14	-8 (-36.36)	3	7	4 (133.00)	4	7	3 (75.00)	1	2	1 (100.0)
Model Rearer	51	15	8	-7 (-46.67)	1	3	2 (200.00)	2	3	1 (50.00)	1	2	1 (100.0)
Chick Rearer	64	26	13	-13 (-50.00)	1	4	3 (300.00)	2	4	2 (100.0)	1	3	2 (200.0)
Mini Hatcherer	49	15	2	-13 (-86.67)	2	5	3 (150.00)	1	2	1 (100.0)	1	5	4 (400.0)
All Average	66.25	19.50	9.25	-10.25 (-47.44)	1.75	4.75	3 (171.43)	2.25	4	1.75 (77.78)	1	3	2.00 (200.0)

Note: Figure in the parenthesis indicates the percentage.

Source: Field Survey, 1995-96

Table-9.2. Change in Employment and Dependency Status of the Different Category of Farmers.

Category of Farmers	Total Family Member	Occupation											
		Home Keeping			Student			Infant			Inactive		
		Before	present	change	Before	present	change	Before	present	change	Before	present	change
Key Rearer	101	23	23	-	20	30	10 (50.00)	25	16	-9 (-36.0)	3	2	-1 (-33.33)
Model Rearer	51	12	12	-	10	16	6 (60.00)	8	6	-2 (-25.0)	2	1	-1 (-50.00)
Chick Rearer	64	10	10	-	9	15	6 (66.67)	13	12	-1 (-7.69)	2	3	1 (50.00)
Mini Hatcherer	49	12	12	-	10	17	7 (70.00)	6	5	-1 (16.67)	2	1	-1 (-50.00)
All Average	66.25	14.25	14.25	-	42.25	19.50	7.25 (59.18)	13.00	9.75	-3.25 (-33.33)	2.25	1.75	-0.50 (-22.22)

Note: Figure in the parenthesis indicates the percentage.

Source: Field Survey, 1995-96

After the membership of BRAC a great change was found in employment and dependency status. 47.44 percent of family members of the respondent family decreased occupation as a day labourer (Table-9.1). Table-9.1 and Table-9.2 also show that the members of sample farm families increased their occupation in the field of agriculture, rickshaw/van pulling, petty business and education.

Conclusions

It was observed that the members of SLDP of BRAC earned higher extra income from poultry. Thus it is clear that poultry production under SLDP of BRAC increased production and income of the participating household. The most promising aspect was that the membership of BRAC of rural women of the participant households as evidence from these women increased participation in family contribution and helps to positive change in socio-economic condition such as increased literacy, land ownership and tenure arrangement, number of livestock, number of houses, food consumption, annual income, expenditure and employment and decrease dependency status.

The findings in general suggest that rural asset less women were benefited significantly by rearing poultry birds under SLDP program. They earned higher income and also spent more to meet up basic needs of their family. On this count of overall impact of poultry raising on the poor households under study is quite commendable.

References

Aziz K.M. A. (1989), *Gender Creation from Birth to Adolescence in Rural Bangladesh* in Gender and the Household Domain: Social and Cultural Dimensions, Krishnaraj, M. and Chanana, K.(ed.). New Delhi: Sage Publication.

Ahmad, N. (1991) , *Women's role in Bangladesh*, Farm Economy.

Ahmed, S. and Islam, N. (1985), *Backyard Poultry Development Project in 100 Villages* (Sponsored by Bangladesh Agricultural University and Assisted by UNICEF, Bangladesh), Proceeding of the First Conference of Bangladesh Animal Husbandry Association, February 23-24, 1985, BRAC, Dhaka.

BBS (1986), *Report of the Bangladesh Household Expenditure Survey 1981-82*, Ministry of Planning, Dhaka.

BBS (1995), *Statistical Year Book of Bangladesh*, Ministry of Planning, Govt. of Bangladesh, Dhaka.

Begum, A. and Chakrabortty, K. (1995), *Economic Contribution of Rural Women and their Participation in one Household Decision-Making Process in Bangladesh.*, The Bangladesh Journal of Agricultural Economics.18 (1).

Begum, N. (1988), *Pay or Purdah? Women and Income Earning in Rural Bangladesh*, Dhaka, University Press Ltd.

Chafetz and Dworkin (1986), *Female Revolt: Women's Movement in World and Historical Perspective*, Totowa: N.J.Rowman and Allanhold.

Duza. A (1989), *Bangladesh Women in Transition Dynamics and issues* in women and population Dynamics: perspective from Asian Countries, Mahadevan K. (ed), Sage publication, New Delhi.

Grameen Bank (1993), Monthly Statement, June, Dhaka, Bangladesh.

Huque, Q. M. E. (1992), *Rural Poultry in Bangladesh Economy*. Proceeding: *Fourth National Conference 1992*, Bangladesh Animal Husbandry Association.

Islam, A. F. M. N. (1987), *Poultry Raising in a Comilla Village: A Survey of Existing Facilities and Problems*, Bangladesh Academy for Rural Development, Comilla, Bangladesh.

Jabbar, M. A. and Green D. A. G (1983), *The Status and Potential of Livestock within the Context of Agricultural Development Policy in Bangladesh*, Department Of Agricultural Economics, The University College of Wales U. K.

Kabir, M and et al. (1989), *Factors Affecting Family Welfare Education and Motivation Programmes in Rural Development Context*, Proceedings of Population Transition in South Asia, Indian Association for the Study of Population.

Kabir, M and et al. (1993), *Impact Of Women in Development Projects on Women's Status and Fertility in Bangladesh*, Development Researchers and Associates (DRA), Dhaka.

Kabir, N.N. (1996), *Impact of Income, Education, Nutrition and Family Planning Intervention on Women's Development*, BARD, Kotbari, Commilla.

Karim, A. M. A. and Mainuddin, G. (1989), *Evaluation on the Field Activities of Backyard Poultry Raisers in Bangladesh*, UNICEF, Dhaka.

MIDAS, (1990), *Poultry Production under Putting - Out system*, A Subsector Study.

Mizan, A.N. (1992), *Rural Women's Economic Participation and Decision-Making Power in the Family: A study on Grameen Bank in Bangladesh* (Mimeo), Department of Sociology in the Graduate School Southern Illinois University, USA.

Noman, A. (1983), *Status of Women and Fertility in Bangladesh*, University Press Ltd. Dhaka.

Rahman, M. H.(1995), *Production of Homestead Enterprises: Implications on Income and Women's Status*, The Bangladesh Journal of Agricultural Economics.18 (1).

Sazzad, M. H. (1986), *Reproductive Performance of Desi Hens under Scavenging and Intensive System of Rearing Proceeding of 1st Annual Livestock Research Workshop*, Bangladesh Livestock Research Institute, Savar, Dhaka.

Schaffer, T.C. (1986), *Survey Of Development Projects and Activities for Women in Bangladesh*, USAID, Dhaka.

Shehabuddin, R. (1992), *Empowering Rural Women: The impact of Grameen Bank in Bangladesh*, Grameen Bank, Dhaka.

Talukder, R. K. and Miah, M. T. H. (1982), *Performance of Rural Poultry Development Project in Mymensingh*, Bangladesh Journal of Agricultural Economics, 5(2): 73-84.

ISSN 1019 - 9624
The Bangladesh Rural Development Studies Vol. X No. 1 (2002)

Status of Existing Husbandry Practices of Dairy Cattle in the Northern Part of Bangladesh

- Samir Kumar Sarkar*

Abstract

The study was conducted to know the existing dairy cattle production, management and product utilization policy of the farmers in two northern districts of Bangladesh during January – April 1998. Opinions of 100 farmers have been discussed in the paper. The Findings of the study show that the education level of the farmers had positive relationship with the adoption of new technology. Ownership of exotic and indigenous dairy cattle in the study area was only 0.29 and 0.95 per household respectively. The maximum milk production of exotic and indigenous cattle was found to be 10.00 liters and 2.90 liters respectively. Rice straw and green grass supplied to the exotic breed were 4.36 kg and 15.59 kg respectively per day per cow, while incase of indigenous cattle it was only 4.26 and 10.80 kg respectively. Finally, consumption of milk was found higher among the large farmers compared to others. It was found that most of the landless farmers used their income from livestock for their daily necessities, while the large farmers spent this income for their children's education, clothing and purchasing of land. Non-availability of balanced ration and improved breed was identified as the most important problem of existing dairy cattle production in the northern part of Bangladesh.

* Assistant Director, Rural Development Academy, Bogra.

Introduction

The traditional cattle rearing in Bangladesh used to be small hold ownership where the farmers mainly aimed at crop production. However, very recently farmers have shown keen interest in rearing cattle intensively for the milk production at private sector. It indicates that the cows are tied up and provided with minimum facilities for exercise. Feeds, both roughage and concentrate, are procured by the farmers and the cows are fed while tied up. The situation in mini-dairy farms is totally different compared with the traditional system. Traditionally, the practice of concentrate feeding used to be very limited at farmer's level. Some of the research reports indicate that improved feeding has a positive effect on fertility, particularly in the female (Ghosh et at 1993). Again, loss of postpartum body weight has a direct negative effect on the resumption of ovarian cycle in the cow and this could be minimized by supplying improved, balanced diet (Butler and smith, 1989). Recently, considerable efforts have been directed towards the improvement of the nutritive value of rice straw and its utilization. Saadullah (1991) reported that urea-molasses-block supplementation to rice straw diet increased digestibility and consumption of straw as well as live weight and milk production of cows. Eventually, most of the animals are reared by the rural farmers and livestock farming is a secondary and supporting activity to crop farming. But with the increasing trend of human population by 2.4% per year (BBS 1996), the farms are becoming smaller and smaller in size. The bovine animals possessed by farm households per acre of cultivated land are 1.04. The small, the medium and the large farmers had 1.58, 0.93 and 0.64 bovine animals per acre of cultivated land respectively (Dickey, 1985). There is only one milch cow for 28 people in Bangladesh producing only about 0.66 liter of milk per day (BBS, 1995). In the northern part of the country Bogra and Sirajgonj districts are very potential milk pocket areas of Bangladesh. The dairy cattle available in these areas are local, Sindhi, Shahiwal, Holstein-Friesian and their crosses. A

number of farmers in these areas established mini-dairy farms for producing milk commercially and marketed the produced milk to their local market as well as to the Dhaka city after the inauguration of the Bangabandhu Bridge over the river Jamuna. But data on mini dairy farming are not available. Therefore, with the above views in mind, this study had been carried out with the following objectives:

1. To know the existing rearing system of dairy cattle;
2. To assess the profitable income generating activities in dairy cattle rearing by different farm categories in the northern part of Bangladesh.

Materials and Methods

The study was conducted in two thanas of Bogra and Sirajgonj districts (one Thana from each districts, namely Sherpur and Raigonj respectively. Again, for necessary data collection two villages from each Thana were selected where concentration of diary farm was comparatively high. The villages from Sherpur and Raigonj Thana were Khamarkandi, Dharmokarn, Andra and Khirtola respectively. Data were collected during the period of January to April 1998. A total of 100 households — 20 from each of the categories such as Landless (0-0.5 ha), Marginal (0.51-1.00 ha), Small (1.01-1.50 ha), Medium (1.51-2.00 ha), Large (above 2.00 ha) from both the thanas were surveyed by pre-tested questionnaires. Accordingly, keeping consistency with the objectives, the detailed data of crop-livestock and related socio-economic information were collected from the farmers by interviewing the heads of the households / concerned persons. The confused points were solved by cross checking with family members.

Results and Discussions

1. Education level

The education levels of the farmers were assessed, as it plays an important role for adoption of improved feeding technology and management practices for dairy cattle production. Irrespective of farmers categories, in total 41% farmers could put their signature only, 31% attended primary to secondary level of education, 23% had education between SSC to HSC and only 5 % passed degree or above level of education (Table-1). Higher education level of the farmers influenced in case of adoption of improved feeding technology for livestock (Paul and Saadullah, 1991). The finding shows that the literacy rate of the respondents (41%) was higher than the national rate (32.4%). However, the level of education of the respondents was not encouraging for considering them as advanced farmers. Respondents having SSC level of education and onwards were only 28%.

2. Ownership of Cattle

Distributions of cattle population by farm size are shown in Table-2. It is to be mentioned here that mixed herd practices were very common. The landless farmers did not have any bulls or bullocks. This finding is similar to (Jalil, et al 1995). In the study area for all categories of farmers the average numbers of bullocks, cows, bulls, heifers, male and female calves per household were 0.96, 1.26, 0.57, 0.53, 0.63 and 0.63 respectively. The average number of cows per household was 1.26 and it was 1.04 for the marginal and 1.47 for the medium farmers. The finding shows that the average number of cows per household was higher in the study area compared to the national average 0.80 (BBS, 1996).

3. Availability of Milch Cows

It was found that on an average, the number of exotic breeds per household was only 0.29 (Table-3). The average age of exotic breed at puberty was 25.28 months. On the other hand, the number of indigenous/native breeds per household was 0.95 and age at puberty was found to be 33.88 months. This finding also agrees with the findings of Saadullah et al. (1991). Irrespective of breeds, on an average availability of milch cows was 0.62 per household in the study area, which is much higher than the national average (0.28 cow/household). One point is to be considered that there is a great potentiality of rearing exotic cows but the farmers are rearing native cows in a traditional manner. That is why potentiality of cattle farming was found to be in a position of under utilization. Farmers should be motivated and trained up to rear exotic/cross-bred cows instead of native breeds for using maximum potentiality of rearing dairy cows in the study areas.

4. Production and Utilization Pattern of Milk

Production and utilization patterns of milk from the exotic and the native breeds were recorded and it was found that average length of lactation period of exotic breed was 9.60 months while it was 8.65 months incase of indigenous breed. The highest milk production of exotic breed was 8.60 liters /cow/ day while it was only 2.47 liters incase of native breed (Table-4). It was also noted that family consumption of milk among the farmers having exotic breed was 0.89 litter per day which was three times higher than the farmers who had only indigenous breed.

Percentage of sold of milk produced from the exotic cattle was 81.02% and it was 82.49% in case of indigenous cattle. The farmers also reported that improved feeding and management practices for both the exotic and the indigenous dairy cattle increased their per day milk production.

5. Feed supply

Feed availability for all farm categories was recorded and it was found that supply of feed had a positive relationship with the production performance of dairy cattle. Roughage through supply of straw and green grass and grazing of cattle is the feeding system followed by the farmers in the study areas. Irrespective of farmers' categories on an average per day per cattle availability of rice straw and green grass was 4.36 kg. and 15.59 kg. respectively for exotic breed (Table-5). However, the amount of concentrate feeds like rice kura, wheat bran, oil cake given on an average to every cow per day irrespective of farmers' categories 2.74 kg.,0.38 kg. and 0.30 kg respectively i.e. in total 3.42 kgs. In addition to stall feeding, the cattle were intensively grazed. In most cases, higher grazing periods (5.30 hrs/day) were observed by the landless, the marginal and the small farmers compared to the medium and the large farmers (3.37 hrs/days). Similar findings were observed by Kibria (1991).

On the other hand, incase of indigenous cattle, irrespective of farmers' categories, the amounts of rice straw and green grass supplied to the cows per day per head were 4.26 kgs. and 10.80 kgs. respectively (Table-5). The amount of concentrate feeds like rice kura, wheat bran and oil cake supplied on an average to every cow per day 2.11 kg, 0.31kg. and 0.23 kg. respectively. Most of the farmers, irrespective of farmers categories, had little knowledge about balanced ration of their cows. Moreover, the marginal and the landless farm households could not afford to buy adequate concentrated feed. As a result, most of their lactating as well as dry cows were found undernourished. According to thumb rule, 3 kgs of concentrated feed should be given to a milch cow for its maintenance as well as for first 3 litres of milk production. For the remaining each 3 litres of milk, the cow should be supplied 1.5 kgs of concentrated feed. But in this study, it was found that on an average the indigenous breed of milch cows produced 1.77 litres of milk per day while the exotic breed produced 4.69

litres. So, the farmers were found to provide their milch cows with an amount of feeds which is less than the recommended amount. That is why, this amount should be increased upto 3 kgs of feed for the indigenous cows and about 4 kgs for the exotic cows.

In addition 250 to 500 gms of molasses should be supplied to each milch cow along with sufficient quantity of straw and green grass (1.5 kgs of straw and 6 kgs of green grass are recommended for 100 kgs of body weight).

In the study areas, a big gap has been identified between the recommended cattle feed and the actual feed which was supplied. In Table-5 it is shown that the farmers did not provide a balanced ration at all. They did not supply to their cattle Mashkalai, Khesari or any other pulses as a main source of protein. Similarly; they did not supply maize, wheat or broken rice as a chief source of carbohydrate in the ration. They also informed that due to gradual increase of cropping intensity they could not supply or collect sufficient quantity of green grass for the purpose of stall-feeding.

It is to be mentioned here that the amount of cereal crop and its by-product available in the study area was not sufficient to feed human population as well as their animals. That is why, the feed shortage per animal was a regular phenomenon in the study area and it became more acute for the landless and the marginal farmers` groups. It is a hopeful message that on an average grazing period was found to be 4.09 hours/day irrespective of farmers categories in the study areas.

6. The Uses of Cowdung and Income from Livestock

It was found that the use of cowdung as fuel increased with decrease of the farm size. Therefore, use of cowdung by the Landless, the Marginal, the Small, the Medium and the Large farm groups as manure was found to be 10.97, 13.28,

37,23, 42.48 and 58.80 percent respectively. All categories of farmers used their income from livestock for food purchasing, daily shopping, cloth purchasing, children's education, crop cultivation, land and animal purchasing and also for social festivities. The landless, the marginal and the small farmers spent the major portion of their income to meet up the basic needs, whereas the medium and the large farmers spent their money for purchasing cloth for their children and for purchasing animals. The landless farmers spent higher amount of money (72.30%) for daily shopping. This is because they do not have any land of their own to cultivate. Selling of livestock by-products was obviously required to meet up the daily needs like buying of rice, oil, salt and chilies. On the other hand the large farmers used only 46.10% for daily shopping and 53.90% for other purposes. This information does not support the findings of Jalil, et al. (1995). They found that the large farmers utilized 60.28% for daily shopping and 39.72% for other purposes.

Conclusion

In the conclusion, the present study provides information on the variations in nutrition condition; milk production, puberty status and grades of concentrate feeding with existing husbandry practices of dairy cattle using reared in the northern part of Bangladesh. Land holding size was found to have significant relationship with the ownership of cattle. A delayed age of puberty, a prolonged inter-calving period and nutritional imbalance of feeding were the major production constraints. To improve this existing situation in milk production the farmers will have to be motivated for rearing crossbred cows as well as for supplying balanced ration to their dairy cattle. Especially, concentrate feed with green grass has to be supplied to the cattle and good husbandry practice has to be adopted for ensuring better production and reproduction performance. The farmers will have to be trained up and necessary credit should be provided to them for procurement of good quality dairy cows balanced ration and for ensuring vaccines, drug, etc. to increase production up to the satisfactory level.

Tables

Table-1: Education Level of the Farmers in Different Farmers Categories

Farmers category	Can sign only (%)	Class I-X (%)	SSC-HSC (%)	Degree or above (%)	Total (%)
Land-less	56	40	4	0	100
Marginal	61	29	10	0	100
Small	38	4	47	11	100
Medium	33	51	12	4	100
Large	18	32	41	9	100
Total	41	31	23	5	100

Source: Field survey, 1998.

Table-2: Distribution of Livestock in Different Farmers Categories

Farmers category	Bullocks (No.)	Cows (No.)	Bulls (No.)	Heifers (No.)	Calves (No.)	
					Male	Female
Land-less	-	1.17 (47.76)	-	0.11 (4.49)	0.06 (24.49)	0.57 (23.26)
Marginal	0.62 (18.29)	1.04 (30.68)	0.09 (2.66)	0.60 (17.70)	0.54 (15.93)	0.50 (14.74)
Small	0.73 (17.22)	1.22 (28.77)	0.35 (8.25)	0.73 (17.22)	0.61 (14.39)	0.60 (14.15)
Medium	1.59 (25.85)	1.47 (23.90)	1.18 (19.19)	0.44 (7.15)	0.78 (12.68)	0.69 (11.23)
Large	1.85 (28.12)	1.38 (20.90)	1.21 (18.39)	0.76 (11.55)	0.59 (8.97)	0.79 (12.00)
Average	0.96 (20.96)	1.26 (27.51)	0.57 (12.45)	0.53 (11.58)	0.63 (13.75)	0.63 (13.75)

Figures in the parenthesis indicate percentage.
Source: Field survey, 1998.

Table-3: Distribution of Milch Cows and their Age at Puberty in Different Farmers Categories

Farmers category	Exotic breed		Indigenous / Native breed	
	No. per household	Puberty (months)	No. per household	Puberty (months)
Land-less	0.23	25.60	0.94	34.62
Marginal	0.20	26.40	0.84	33.20
Small	0.27	24.73	0.90	33.11
Medium	0.38	25.50	1.09	35.47
Large	0.39	24.20	0.99	33.00
Average	0.29	25.28	0.95	33.88

Source: Field survey, 1998

Table-4: Average Production of Milk According to Breeds (liter/cow/day)

Farmers category	Exotic breed						Indigenous breed					
	L.P (month)	Max. Pdn	Min. Pdn	Av. Pdn	Sell out	Consumption	L.P (month)	Max. Pdn	Min. Pdn	Av. Pdn	Sell out	Consumption
Land-less	10.00	7.00	1.00	4.45	4.00 (89.89)	0.45 (10.11)	8.60	2.50	0.25	1.80	1.50 (83.33)	0.30 (16.67)
Marginal	9.50	6.50	0.90	4.50	4.00 (88.88)	0.50 (11.12)	8.68	2.04	0.32	1.28	1.00 (78.13)	0.28 (21.87)
Small	9.00	9.50	1.50	5.00	4.00 (80.00)	1.00 (20.00)	8.75	2.50	0.50	1.80	1.50 (83.33)	0.30 (16.67)
Medium	9.50	10.00	1.00	4.50	3.50 (77.78)	1.00 (22.22)	8.82	2.41	0.46	1.93	1.60 (82.90)	0.33 (17.10)
Large	10.00	10.00	1.50	5.00	3.50 (70.00)	1.50 (30.00)	8.40	2.90	0.66	2.04	1.72 (84.31)	0.32 (15.69)
Average	9.60	8.60	1.18	4.69	3.80 (81.02)	0.89 (18.98)	8.65	2.47	0.44	1.77	1.46 (82.49)	0.31 (17.51)

Figures in the parenthesis indicate percentage

Source: Field survey, 1998.

L.P = Lactation Period

Max. Pdn = Maximum Production

Min. Pdn = Minimum Production

Table-5: Supply of Feed According to Breeds and Farm Categories

Farmers category	Exotic						Indigenous					
	Roughage (kg.)		Concentrate (kg.)			Grazing time (hrs)	Roughage (kg.)		Concentrate (kg.)			Grazing time (hrs)
	Rice straw	Green grass	Rice kura	Wheat bran	Oil cake		Rice straw	Green grass	Rice kura	Wheat bran	Oil cake	
Land-less	4.00	14.00	2.03	-	0.10	5.30	5.34	10.08	1.98	-	0.10	4.50
Marginal	4.38	12.40	2.44	-	0.15	4.62	3.24	12.10	1.90	-	0.13	4.00
Small	4.37	15.23	2.50	0.18	0.26	5.00	3.51	12.92	2.03	0.19	0.20	4.30
Medium	4.40	17.71	2.91	0.30	0.38	3.96	4.54	10.03	2.55	0.25	0.22	3.57
Large	4.66	18.62	3.80	0.67	0.65	3.37	4.69	8.85	2.08	0.50	0.50	4.07
Average	4.36	15.59	2.74	0.38	0.30	4.45	4.26	10.80	2.11	0.31	0.23	4.09

Source: Field survey, 1998.

Table-6: Utilization of Cowdung and Distribution of Income

Farmers category	Cowdung (%)		Distribution of income (%)					
	Fuel	Manure	Daily shopping	Education	Cloth purchasing	Animal purchasing	Land purchasing	Festival
Landless	89.03	10.97	72.30	8.51	14.35	2.04	-	2.80
Marginal	86.72	13.28	55.00	4.00	8.03	2.30	28.60	2.07
Small	62.77	37.23	56.27	6.73	11.02	3.21	2.77	2.00
Medium	57.52	42.48	47.32	4.54	12.50	4.99	26.05	4.60
Large	41.20	58.80	46.10	5.02	13.32	8.60	25.06	1.90
Average	67.45	32.55	55.40	5.76	11.84	4.23	20.10	2.67

Source: Field survey, 1998.

References

Akter, K.F.B. Lily and N. Karim (1984), *Women's role in Livestock Production* in *Bangladesh,* Bangladesh Agricultural Research Council, Farm Gate, Dhaka-1215.

BBS (1985), *Statistical Pocket Book of Bangladesh,* Ministry of Planning, People's Republic of Bangladesh.

Butler, W.R, and R.D. Smith (1989), *Inter-relationship Between Energy Balance and Postpartum Reproductive Foundation in Dairy Cattle,* Journal of Dairy Science vol. 72. pp. 767- 783.

Ghosh, A, M.G.S Alamand, M.A. Akbar (1993), *Effect of Urea-molasses-mineral Block Supplementation on Postpartum Ovarian Activity in Zebu Cows,* Animal Reproduction Science, Vol. 31, pp. 61-67.

Jalil, M.A., N.R. Sarker, D.C. Paul, and A.A. Khan (1995), *Status of Existing Husbandry Practices of Dairy Cattle at Manikgonj, Bangladesh,.* Bangladesh Journal of Animal Science, Vol. 24 (1-2), pp.71-80.

Kibria, S.S (1991), *Animal Nutrition Status in Bangladesh; Past, Present and Future,* Paper presented at the workshop on Livestock Development in Bangladesh, BLRI, Denmark, July 16-18, 1991.

Paul, D.C. and M. Saadullah (1991), *Role of Women in Homestead of Small Farm Category in an Area of Jessore,* Bangladesh Livestock Research for Rural Development, Vol. 3 (2), pp.23-29.

Saadullah, M. (1991), *The Importance of Urea Molasses Block and By-pass Protein on Animal Production,* Proceedings of International Symposium on Nuclear and Related Techniques in Animal Production and Health, IAEA, Vienna, IAEA-Am-318/28, pp.49- 53.

Saadullah, M.A. Haq, M.H. Mandal and M.A. Wahid (1991), *Third Annual Report on Livestock and Poultry Development in Bangladesh,* Rotary Foundation of Mymensingh District, Mymensingh, Bangladesh.

ISSN 1019 - 9624
The Bangladesh Rural Development Studies Vol. X No. 1 (2002)

Evaluation of Different Seed Treatment Procedures as a Tool for Improving Seed Health Quality

AKM Zakaria*

Abstract

A study was conducted at the International Rice Research Institute (IRRI), Los Banos, Philippines during September, 2000 to evaluate different seed treatment procedures used by farmers as a tool for improving seed health quality. Farmers varieties i.e., C-1, RC-54 and Tankad were used with five treatments (winnowing, flotation, chemical treatment, manual sorting and control). The detection levels used were physical quality evaluation, RGI, between paper germination, in-soil germination and blotter test.

The results showed that there was significant variation among the varieties and treatments in respect of RGI. Germination was significantly affected by treatments and detection levels. Regarding physical evaluation of best seed var. C-1 showed superiority over other two varieties and on the other-hand manual sorting contained the highest percent of best seed. Considering treatment effect and detection level the highest percent of Fm and So were found in control. In case of LSI the highest seedling death was caused by Fm.

Introduction

Rice, the world's most vital food, is propagated by means of matured seed. It carries genetic characteristic for successful crop production. So, planting high quality rice seeds can ensure a good harvest (Huelma, 2000). High quality seed refers to the seed health quality, which is highly significant aspect of agricultural production with both domestic and foreign implications. From a domestic point

of view, the seed health is an important factor in the planting of seed by farmers. From an international point of view it relates to the potential hazards and risks of introducing pest and pathogens of quarantine importance (Khan, 1988)

The operational determinants of seed health are the **seed conditions and seed contaminants**. Seed conditions refer to discolored seeds due to infection of pathogens or insect injury and deformed due to physiological problems, whereas seed contaminants are weed seeds, varietal mixtures, occasionally plant debris and soil particles. All these conditions and contaminants are associated with poor seed health. The infected seeds not only deteriorate the health but also spreads the pathogen it carries. On the other hand contaminants maximize crop management activities and minimize yield. Studies on rice seed health were reviewed by T.W. Mew and Misra in 1994.

Objectives

The present study was conducted as a part of the Rice Seed Health Training Programme at the International Rice Research Institute (IRRI), Philippines titled Seed Health Evaluation Experiment to address the following objectives:

General Objectives

- to understand the extent of seed health problem;
- to gather practical knowledge about seed conditions and seed contaminants;
- to gather knowledge about seed cleaning and seed treatment procedure;
- to identify seed germination failure due to seed infection; and
- to learn skills in seed health testing.

Specific Objective

To evaluate different seed treatment procedures as a tool for improving seed health quality.

---

* Deputy Director, Rural Development Academy, Bogra.

Materials and Method

The study was conducted following 2 - factor Factorial RCB design with 3 replications. The following three varieties of farmers seeds were used in combinations with five treatments using five levels of detection.

Variety (3):

V_1 - C -1
V_2-RC-54
V_3 - Tangkad

Treatments (5):

T_1 - Winnowing
T_2 - Flotation
T_3 - Chemical Seed Treatment
T_4 - Manual Seed Sorting
T_5 - Control

Detection levels (5):

Physical Quality Evaluation
Evaluation of Rate of Germination Index (RGI)
Between Paper Method
In-Soil Germination Test
Blotter Test

Treatments:

Winnowing (T_1)

Winnowing was done by placing the seed samples (500 g) to winnowing basket and slowly tilted the winnowing basket to separate the light seeds (unfilled) from the heavy (filled) seeds.

Flotation (T_2)

Sample of 500g from each treatment were soaked in tap water in a jar for 10 minutes and separated the floaters and sinkers and re-dried to 14% moisture content.

Chemical Seed Treatment (T_3)

Slurry of 0.03% Benlate and 0.03 % Dithane M45 as formulated product was prepared first in a jar. Later the 500g seeds were poured in to the jar and were shaken well to obtain an adequate coating of the seed surface.

Manual Seed Sorting (T_4)

Sample of 500g seeds were visually inspected. The seed conditions and seed contaminants were separated under classes following ISTA (International Seed Testing Association) rules.

Control (T_5)

Farmer's original seed were included in the experiment as control to compare effectiveness of the above treatments.

Detection Levels:

Physical Quality Evaluation

Physical Quality Evaluation was done with 40g seed sample to isolate pure seed, mixtures, weed seed contaminant, best seed, discolored and partially filled seed, etc.

Evaluation of RGI

Seedling vigor was evaluated by means of RGI. Data of germination at 4 days after seeding was divided by the number of seed germinated at 7 days after seedling and expressed in percentage.

Between Paper (BP) Method

Four replicates of hundred seeds of each treatment were placed between 2 paper towels previously soaked in distilled water. The rolled towels were then placed in incubation room at 28^0C. Observations for normal seedling were done at 5, 9 and 14 days after seeding.

During the final reading, dead and abnormal seedlings were placed in blotter pan plates for inspection of Lethal Seed Infection (LSI) after incubation for one week.

In - Soil (IS) Germination Test

One hundred seeds were equally planted in four shallow furrows in trays full of soil. The seeds were then covered with a thin layer of soil and irrigated lightly. The process was replicated four times for each treatment. The trays were placed in green house at 28°C for 14 days. Observation for germination were made on 5,9 and 14 days after placement.

Between Paper (BP) Test

Two layers of blotter papers moistened with distilled water were placed in sterile petri plates. Twenty-five seeds were placed in equidistant on each perti plates. Each treatment was plated on 16 petri plates and were incubated at 22 °C under 12 hours light and 12 hours dark cycle with NUV (Near Ultra Violet) lights for 7 days. Observations were made after 7 days of placement using stereo binocular and compound microscope. Clean seeds were defined and counted as seed without any microbial growth at the end of the test.

The Between paper and In-Soil Germination Test were applied mainly to evaluate the percent germination of normal seedlings. The Blotter Test was used to detect seed-born pathogens. Also, the dry seed inspection method was applied to separate seed contaminants by manual seed sorting.

Data Analysis

Data were processed and analyzed using IRRI Stat Programme. Variances were established by using Duncan's Multiple Range Test (DMRT).

Results and Discussion

For vigor test, the Rate of Germination Index (RGI) method was used. There was significant variation among the 3 varieties and treatments. C-1 (80.62 %) was obtained the highest RGI followed by RC-54 (76.44 %). Tangkad (72.40 %) had significantly the lowest RGI than other two varieties. Based on treatment means, flotation (83.24 %) showed the highest RGI followed by manual sorting (82.06 %), control (77.19 %) and winnowing (76.57 %). Chemical (63.37 %) treatment significantly showed the lowest RGI (Table-1).

Table-1: Rate of Germination Index (%)

Treatment	Variety			Treatment-mean
	C-1	RC-54	Tangkad	
Winnowing	84.16b	73.66a	71.88b	76.57ab
Flotation	83.97b	84.35a	81.42b	83.24b
Chemical	63.97a	70.27a	55.92a	63.37a
Manual Sorting	85.17b	75.49a	85.51b	82.06b
Control	85.85b	78.46a	67.26b	77.19ab
Mean	80.62a	76.44a	72.40b	76.48a
LSD (5%)	15.31			

Means in the column followed by the same letter(s) are not significantly different by DMRT at 5% level.

Germination was significantly affected by treatments and methods with respect to normal seedling. Flotation produced statistically highest number of normal seedlings (93.91%) for both BP and IS test followed by manual seed sorting (92.57%) in BP and winnowing (86.87%) in IS method. Chemical treatment (80.99%) produced statistically the lowest number of normal seedlings in BP method (Table-2). The comparison between methods i.e. BP and IS is presented in Figure-1.

Table-2: Between Paper (BP) and In-Soil (IS) Test (normal seedling)

Treatment	Method	
	BP	IS
Winnowing	87.75ab	86.87a
Flotation	93.91a	92.54a
Chemical	80.99bc	82.99a
Manual Sorting	92.57a	84.27a
Control	84.72b	72.76b
Mean	87.98	88.86

Means in the column followed by the same letter(s) are not significantly different by DMRT at 5% level.

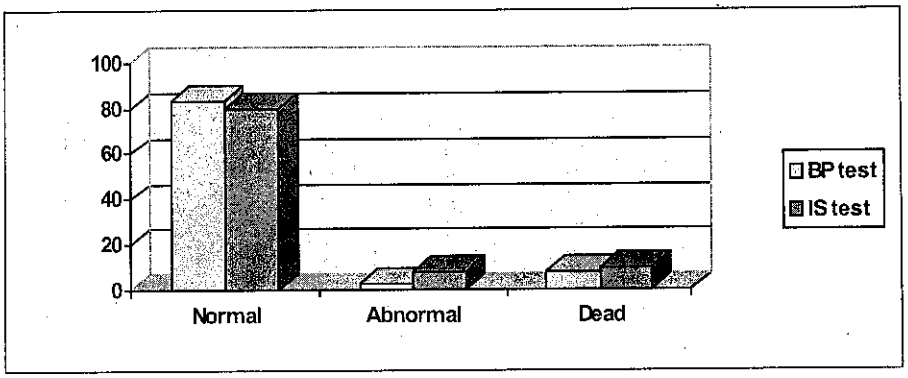

Fig. 1 Comparison of BP and IS test for percent germination.

Regarding physical evaluation of best seed, the treatment means of seed-lot C -1 (74.74%) showed superiority over Tangkad (72.22 %) and RC-54 (52.11 %). On the other hand, Manual Sorting (87.06 %) contained the highest percent of best seed. The lowest percent of best seed was found in Flotation (57.5 %) (Table-3 and Figure-2).

Table-3 : Physical Evaluation for Best Seeds

Treatment	Variety			Treatment mean
	C-1	RC-54	Tangkad	
Winnowing (WIN)	67.90a	45.60a	71.88a	61.80
Flotation (FLO)	56.15a	40.63a	75.71a	57.50
Chemical (CHE)	78.68ab	43.99a	66.34a	63.00
Manual Sorting (MAN)	100.00b	86.40b	74.78a	87.06
Control (CON)	70.97ab	43.89a	72.38a	62.41
Mean	74.74	52.11	72.22	66.52
LSD (5%)	28.62	28.62	28.62	12.80

Means in the column followed by the same letter(s) are not significantly different by DMRT at 5% level.

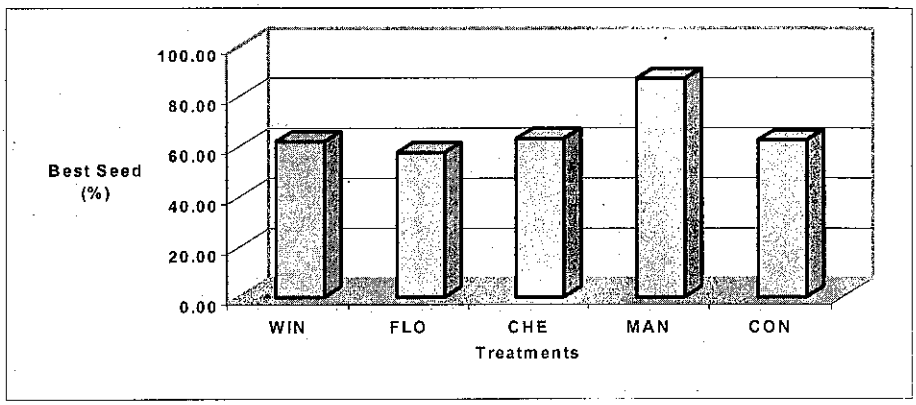

Fig. 2 Best seed comparison between treatments

All the varieties and treatments significantly affected the seed in respect of percent clean seed and percent seed-born fungi detected. Among the varieties C-I and RC-54 had significantly lower percent of clean seed, 24.6% and 26.3%, respectively. On the other hand, Tangkad contained significantly the highest percent of clean seed 38.8%.

Incase of detection, the percent of *Fusarium moniliforme* (3.3%) and *Sarocladium oryzae* (3.53%) were significantly the highest in Tangkad whereas significantly the highest count of *Aphelenchoides besseyi* was found in C-I (41.73 nematodes) (Table-4).

Table-4 : Detection of seed-born fungi for different varieties (Blotter Test)

Variety	Clean seed	Fm	So	Ab
C-1	24.66b	0.26b	0.20b	41.73a
RC-54	26.33b	1.73b	0.40b	5.73b
Tangkad	38.8a	3.33a	3.53a	0.26b
Mean	29.93	1.77	1.38	15.91
LSD (5%)	2.60	1.66	0.96	17.17

Means in the column followed by the same letter(s) are not significantly different by DMRT at 5% level.

Considering treatment effect and detection level significantly the highest percent of *Fusarium moniliforme* and *Sarocladium oryzae* were found in control, whereas significantly the highest percent of *Aphelenchoides besseyi* was found in manual sorting. In all the cases chemical had the lowest detection percent (Table 5).

Table-5 : Detection of seed-born fungi at different seed treatments (Blotter Test)

Treatment	Clean seed	Fm	So	Ab
Winnowing	10.00d	1.22b	1.55b	11.00b
Flotation	14.70c	2.33ab	1.33b	12.20b
Chemical	95.33a	0.26b	0.26b	0.55c
Manual Sorting	20.44b	1.77b	1.11b	31.11a
Control	9.11d	2.55a	2.88a	24.22ab
Mean	29.92	1.83	1.43	15.82
LSD (5%)	3.37	2.15	1.40	22.17

Means in the column followed by the same letter(s) are not significantly different by DMRT at 5% level.

Fm = *Fusarium moniliforme*, So= *Sarocladium oryzae*, Ab = *Aphelenchoides besseyi*

In case of Lethal Seed Infection (LSI) data showed the number of seed or seedling death due to infection. The highest LSI was caused by *Fusarium moniliforme* (2.65%) in variety Tangkad. Lower LSI was due to *Alternaria padwickii, Sarocladium oryzae* and *Microdochium oryzae* (Table 6).

Table-6 : Lethal Seed Infection (LSI)

Variety	Pathogen			
	Fm	Ap	So	Mo
C-1	0.566	0.1167	0.0167	0
RC-54	0.316	0.0167	0	0
Tangkad	2.6367	0.0333	0	0.0167
LSD (5%)	ns	ns	ns	ns

Fm = *Fusarium moniliforme*, So = *Sarocladium oryzae* , Ap = *Alternaria padwickii*
Mo = *Microdochium oryzae*.

References

Huelma, C.C. (2000), *Seed Treatment of Rice*, Training Handout, IRRI, Los Banos, Philippines.

Khan, R.P. (1998), *Importance of Seed Health in International Seed Exchange*, Rice Seed Health Unit, IRRI, Los Banos, Philippines.

Mew, T.W; Bridge, J; Hibino, H.; Bonman, J.M. and Merca, S.D. (1998), *Rice Pathogens of Quarantine Importance*, Rice Seed Health Unit, IRRI, Los Banos, Philippines.

Mew, T.W. and Misra, J.K. (1994), *A Manual of Rice Seed Health Testing*, IRRI, Los Banos, Philippines.

ISSN 1019 - 9624
The Bangladesh Rural Development Studies Vol. X No. 1 (2002)

Low-Cost DTW and its Multipurpose Use : Findings of an Experimental Project of Rural Development Academy, Bogra

M. A. Matin[1]
Mahmud Hossain Khan[2]
Md. Nazrul Islam Khan[3]

Abstract

Proper utilization and management of available water resources are the key factors in accelerating our agricultural development. But due to lack of proper utilization and Operation and Maintenance (O&M) of water abstraction devices (DTWs & STWs) and pumps, the static water levels in the aquifer decline rapidly in many places throughout the country during the peak irrigation season. As a result, costs of extracting water increases. Keeping the above fact in mind, RDA has successfully carried out on experiments in developing the low-cost DTW technology. The main attempt has been to assure water supply from main aquifer by low-costs and efficient DTW and develop an economical design which is suitable for Bangladesh context. The present cost of a 56 lps (2-cusec) DTW of RDA model is around Tk. 3,28,000.00 (Three lac twenty thousand) only. For example, RDA, Bogra has already installed 17 DTWs having different capacities at the different areas of Bangladesh in 1995 to 2000 with a cost ranging from Taka 60,000.00 to 5,25,000.00 which is about 30% to 40% of total cost of a traditional DTW. The working life span of these DTWs is expected to be about 25 years. GO, NGO may come forward for replicating this type of model. If this model is replicated in all over Bangladesh that would be help for command area development as well as overall agricultural and drinking water development of the country. So, it could be used as multipurpose uses (like, irrigation, drinking, domestic, industries, fisheries, livestock) and so on. This model may also be replicated in those countries where similar problem exists.

---

[1] Joint Director, Rural Development Academy, Bogra
[2] Deputy Director, Rural Development Academy, Bogra
[3] Deputy Director, Rural Development Academy, Bogra

1. Introduction

Irrigated agriculture has been playing a vital role for increasing crop production in Bangladesh. So, there has been a continued growth of irrigation in the country over the last decades, which has become dependent mainly on groundwater. According to NMIDP (1998) contribution of groundwater irrigation has gone up to 71% in 1996-97 through the use of 25,201 DTWs, 201 FMTWs, 6,29,841 STWs and 1,39,157 modern manual pumps (Treadle pump, Rower pump & MOSTI). The expansion of irrigation is a vital component of the strategy of the government for increasing agricultural production in order to attain food security. Simultaneously, the need for pure drinking water has also increased due to ever increasing population of the country. Therefore, the demand for groundwater has significantly increased during the Fifth Five-Year Plan (1997-2002) period for satisfying the future irrigation and domestic water needs of the country. The role of DTW for groundwater abstraction in the country has been a great concern due to its high costs because of privatization policy of the government and withdrawal of all subsidies on minor irrigation equipment. Presently, the full cost of a 56 litre / sec (2-cusec) DTW is about Tk. 10 to 15 lacs depending on aquifer conditions which is too high for individual farmers to afford. The expansion of DTW use in the private sector has already been stagnated due to high capital investment, complex management system and short-term dry season use (only for boro rice which is not economically viable). To this end, some radical changes in the approach of tubewell design and construction and in pumping equipment have been attempted under the National Minor Irrigation Development Project - NMIDP (Mott MacDonald, 1992). This project intended to promote private sector development through deregulation of equipment supply and tubewell siting. Withdrawal of GOB's subsidy has been the major influencing factor for the design of tubewells under NMIDP using cheaper methods and materials and smaller pump sets in a range of capacities from 7 to 28 lps. New concepts in tubewell technology proposed under NMIDP was demonstrated by BADC in a small scale during 1990 - 91. The program was initiated with the installation of 100 force mode tubewells (FMTWs) of 14 and 28 lps and deep-set shallow tubewells (DSSTWs) in 5m deep concrete line pits. The FMTWs were equipped with small diesel engines and vertical turbine

pumps from the local market. The tubewells were drilled by the water jet method and equipped with locally manufactured slotted PVC screen and steel upper well casing. Construction, commissioning and equipment costs for each FMTW of 14 lps capacity was estimated to Tk. 2 lacs. Operating and maintenance costs of NMIDP tubewells have been reviewed by AST/CIDA (1991) and found that for diesel operated tubewells the costs are more than double than those for electric power. The designs of FMTWs are regarded as site specific and typical of systems suitable only for NMIDP. Therefore, the NMIDP technology could not be popularised at the farmer's level throughout the country.

In order to overcome the difficulties mentioned above and to help the farmers, RDA developed demand based DTWs with low capital investment and its year round multipurpose uses (irrigation, drinking, domestic, industries, fisheries, livestock).

2. Objectives

The main objective of the project is to develop low-cost deep tubewell for multipurpose use. The specific objectives are as follows:

1. To find out an appropriate low-cost drilling techniques for ground water extraction in different areas of Bangladesh.
2. To develop an economical DTW design which is suitable for Bangladesh context.
3. To ensure the quality drinking water as well as irrigation water.
4. To popularize a low-cost DTW for multipurpose use in different areas of Bangladesh.

3. Methodology

Relevant data has been collected through structure questionnaire from all the deep tubewells under experimentation in 2000. Some information have been taken from secondary sources.

4. Detail of Low-Cost DTW Model

A. Low-Cost DTW Model

The Rural Development Academy, Bogra has developed the Low-Cost DTW Model in 1998. It has got the superiority over the traditional DTWs, especially in respect of cost and supply of water on regular basis. Total cost of abstracting water by traditional DTWs becomes high because of selecting of bigger size of pump and prime mover (engine/motor) without consideration of the actual demand of water abstraction and high power consumption. For a traditional DTW running with a 30 hp motor the annual electric bill is around Tk. 30 to 35 thousand. Usually the DTWs remain idle during off irrigation season. If the power line is not disconnected there will be again a minimum bill for line rent. Ultimately, the operational cost of such a traditional DTW has become a burden to the users unless the command area is large. Due to high capital investment and operation and maintenance costs as well as complex management system, use of traditional DTW only for seasonal irrigation purpose has not been found economically cost effective. Keeping the above facts in view, RDA has carried out the experiment for developing the low-cost demand based DTW technology which having a capacity ranges from 14 to 56 lps. It has ensured water supply from the main aquifer by a low-cost demand specific DTW which is based on economical design and is suitable for Bangladesh context.

The RDA developed DTW Model is demand based where due consideration is given to calculate the actual demand of water abstraction and select the size of the pump and prime mover (motor) accordingly. Here, the question of different sizes of DTWs arises depending on the demand of the users. Until now the sizes of RDA developed DTWs vary from 0.75 hp to 30 hp; at the same time discharge capacity of pumps varies from .84 lps to 56 litre / sec. The RDA developed DTW is low-cost in the sense that the materials are locally available, the drilling technique is manual and cost effective, power consumption is low and the total capital investment is less. A comparative analysis of RDA developed DTW and a traditional DTW in respect of materials requirement, drilling, capacity utilization of pumping equipment and capital investment etc. is presented in **Table-1**.

Table-1: Comparison between RDA Developed DTW Technology and the Traditional One

Components/ Materials	RDA DTW	Traditional DTW
i. Drilling Method	Manual water jetting and Reverse circulation which is easy and cost effective	Traditional Rig methods (Hydraulic Rotary and Reverse Rotary)
ii. Housing Pipe	PVC, RCC, or 4 mm MS sheet	MS sheet, Fibre glass
iii. Strainer	PVC, Bamboo net	Stainless steel, Fibre glass
iv. Prime mover size	Demand based (Min. 0.75 – 30 hp)	Not demand based Normally 20-30 hp
v. Pumping plant	Submersible/ Mono sub pump	Deep well Turbine pump
vi. Pump House/ shed	No need	Compulsory
vii. Pump Efficiency	High	Low
Viii. Power Transmission Loss	Low	High
ix. Prime mover Breakdown and Repair	Rewinding and early repairable	Repair is difficult
x. Damage due to natural hazards and flood	No damage and can be operated during flood	Possibility of damage and can not be operated during flood
xi. Threat of stealing	Not possible	Possible
xii. Construction cost	Low (0.50 – 5 lac)	High (about 10-15 lac)

The drilling technique adopted by RDA in installing DTW is manual which is Reverse Circulation (RC) method for which no high cost drilling rig is required. Total drilling system from test boring to drilling of main production well is manual. Manual method of drilling is very easy and cost effective as compared to the traditional rig methods.

B. Low-Cost DTW Design and Cost Estimates

Well design of RDA developed DTW is completely based on test drilling data and the opening area and slot size is dependent on the sieve analysis results. Finally, wells are designed using this grain size distribution curve. Pumping device for the DTW is submersible pump which is very efficient in pumping and power utilization.

Cost Estimates

The major constraint in sinking a DTW by an individual owner / farmer is its high cost involvement. Keeping these views in consideration, the concept of low-cost DTW with its multipurpose uses has been introduced by RDA.

The cost of stainless steel (S.S.) strainer is about Tk. 15,000.00 per metre, whereas per meter cost of PVC strainer is about Tk. 600.00 only. Again cost of PVC housing pipe is much cheaper than M.S. pipes. RCC housing pipe, which is successfully used in RDA developed DTW, is also much cheaper (Tk. 300/m), the economic life of the DTW which is constructed by using the PVC pipe and strainer will not be hampered at all. The present cost of a 2-cusec DTW of RDA model is around Tk. 3.00 lac only. Detailed cost estimates of two RDA developed DTWs are presented in **Table-2.**

Table-2 : Detailed Cost Estimate of the Production Tubewell at Village Gulbahar, Union Kadla, Kachua, Chandpur

Item No.	Description	Unit	Quantity	Rate (Tk.)	Amount (Tk.)
1.	Mobilization and demobilization	-	L/S	-	10,000.00
2.	Drilling 375 mm. diameter hole for screen and well casing	lin. m.	128	500.00	64,000.00
3.	Furnishing and installing 286 mm. well casing (MS- 3.88 mm thickness) with centering guides	lin. m.	24	1015.00	24,360.00
4.	MS reducer (286/125 mm)	No.	1	2,500.00	2,500.00
5.	Furnishing and installing 125 mm diameter blind pipe (PVC Class-B) with fittings and centering guides	lin. m.	18	220.00	3,960.00
6.	Furnishing and installing 125 mm. diameter well screan 4-6 No slot (PVC Class-B) with fitting and centering guides	lin m.	85	250.00	21,250.00
7.	Furnishing and installing 125 mm. diameter bail (PVC) plug fitted with end cap	No	1	2,000.00	2,000.00
8.	Furnishing and installing gravel pack	Cu. m.	15	1,050.00	15,750.00
9.	Develop well (Air Jetting/over pumping)	hr.	5	500.00	2,500.00
10.	Furnishing. installing and removing test pump	L/S	-	-	2,000.00
11.	Water quality sampling and analysis.	L/S	-	-	2,000.00
12.	Disinfecting and capping well	L/S	-	-	5,000.00
	Sub-Total				**1,55,320.00**
12.	Submersible pump of K.S.B. brand of India (BPN 425/1+HB 303); 150-200 m^3/h, 22-27 m head	No	1	90,000.00	90,000.00
13.	Column pipe supply and installation of main pump 150 mm dia M.S/GI.	lin m.	-	-	35,424.00
14.	Connection of delivery pipe to the main overhead tank 150 mm. dia M.S/PVC	lin m.	-	-	8,856.00
15.	Pump, starter, cable etc.	L/S	-	-	20,000.00
16.	Complete installation of well, pump, design and supervision	L/S	-	-	5,000.00
	Sub-Total				**1,59,280.00**
	Grand Total				**3,14,600.00**

(Taka Three lakh forteen thousand six hundred only)

Cost estimates of each of the items of RDA developed DTW has been shown separately in **Table-2**. However, total depth of drilling and cost involvement along with the cost of drilling of RDA developed DTWs installed at 17 different locations are presented in **Table-3 and 4**. It is found that the cost of RDA developed DTW ranges from Tk. 0.60 to 5.00 lacs depending on discharge capacity and depth of well. By installing such an improved type of DTW with about 30-40% cost of a traditional DTW the same quantum of water abstraction purpose can be served. Again, the same DTW can be used for multiple purposes like irrigation, drinking and domestic, industrial, fisheries, livestock, etc.

Table-3: Information in Relation to Aquifer Lithology and Drilling of DTWs

DTW No.	DTW Location	Aquifer type	Formation materials	Depth of drilling (m)	SWL(m) (March-April)
1	RDA Demonstration Farm	Un-confined	Medium to coarse sand	115	10
2	Bridge End Facilities (East), Bangabandhu Bridge Area	,,	Medium sand	75	9.5
3	Engineer's Facilities (Alenga), Bangabandhu Bridge Area	,,	Coarse sand	66	,,
4	Engineer's Facilities (Nalka), Bangabandhu Bridge Area	,,	Medium sand	65	,,
5	Resettlement Village (East), Bangabandhu Bridge Area	,,	Free to Medium sand	50	,,
6	Resettlement Village (West), Bangabandhu Bridge Area	,,	Medium sand	60	,,
7	Proshika Training Centre, Kytta, Manikganj	,,	Medium to coarse sand	75	11
8	Shamsuddin Spinning Mills Ltd., Gazipur	Confined	Coarse to medium sand	105	20
9	Mahasthan Mazar, Bogra	Un-confined	Medium sand	50	16
10	Baghabari GT Power Station, Sirajgonj	Semi-confined	Medium to coarse sand	70	12
11	Jamuna Fertilizer Company Premises, Tarakandi, Jamalpur	Semi-confined	Medium to coarse sand with gravel	83	14
12	Nichintapur, Nalitabari, Sherpur	Un-confined	Medium sand	70	14
13	Gulbahar, Kachua, Chandpur	Semi-confined	Coarse sand	130	12
14	Baraipara, Sariakandi, Bogra	Un-confined	Medium to coarse sand	62	8
15	Poragaon, Nalitabari, Sherpur	,,	Medium sand	70	14
16	Kalsamati, Sherpur, Bogra	,,	Medium to coarse sand	27	11
17	Sakhipur, Kachua, Chandpur	Semi-confined	Coarse sand	130	12

Table-4: Year of Installation, Total Cost Involvement and Drilling Cost RDA's Developed DTW

DTW No.	DTW Location	Year of Installation	Drilling Cost (Tk.)	Discharge Q (lps)	Total cost of DTW (Tk)
1	RDA Demonstration Farm	1995	40,000.00	28-56	2,20,000.00
2	Bridge End Facilities (East), Bangabandhu Bridge Area	1998	61,408.00	2.8 - 6.72	2,23,224.00
3	Engineer's Facilities (Alenga), Bangabandhu Bridge Area	1998	36,224.00	2.8 - 6.72	2,14,555.00
4	Engineer's Facilities (Nalka), Bangabandhu Bridge Area	1998	54,496.00	2.8 - 6.72	2,12,242.00
5	Resettlement Village (East), Bangabandhu Bridge Area	1998	17,250.00	2.8 - 6.72	1,32,432.00
6	Resettlement Village (West), Bangabandhu Bridge Area	1998	33,888.00	2.8 - 6.72	1,67,459.00
7	Proshika Training Centre, Kytta, Manikganj	1999	28,000.00	2.8 - 6.72	1,97,500.00
8	Shamsuddin Spinning Mills Ltd., Gazipur	1999	60,000.00	5.6–15.4	2,74,350.00
9	Mahasthan Mazar, Bogra	1999	23,400.00	1.34-2.8	98,480.00
10	Baghabari GT Power Station, Sirajgonj	1999	44,625.00	.22-16.24	2,23,405.00
11	Jamuna Fertilizer Company Premises, Tarakandi, Jamalpur	1999	70,875.00	28-56	4,97,887.00
12	Nichintapur, Nalitabari, Sherpur	1999	36,000.00	28-56	2,72,280.00
13	Gulbahar, Kachua, Chandpur	1999	64,000.00	42-56	3,14,600.00
14	Baraipara, Sariakandi, Bogra	1999	25,000.00	7.28-15.68	3,28,000.00
15	Poragaon, Nalitabari, Sherpur	1999	48,025.00	28-56	3,20,065.00
16	Kalsamati, Sherpur, Bogra	1999	10,000.00	5.6-16.24	60,000.00
17	Sakhipur, Kachua, Chandpur	2000	21,478.00	7.28-15.68	1,25,000.00

In recent years irrigation-cum-domestic water abstraction system developed by RDA have been adopted by many agencies. Barind Multipurpose Development Authority (BMDA) has installed RDA developed DTW model at 26 sites on pilot basis. Moreover, Jamuna Multipurpose Bridge Authority (JMBA), the Local Government Engineering Department (LGED), Proshika, Bangladesh Power Development Board (BPDB) and Jamuna Fertilizer Company Ltd. (JFCL) have installed such low-cost DTWs at Bhuapur, Sirajganj, Sherpur, Manikganj, Baghabari, Bheramara, Jamalpur, respectively. This DTW technology has also been used by some private farmers with the technical support from RDA.

At present, there are in total 17 low-cost DTW have been sunk by RDA at different locations within the country with varied hydro-geologic situations. Location and purpose of installing these DTWs are shown in Table-5.

Table –5: Purposes of the Installed Low-cost DTWs

DTW No.	DTW Location	Purpose	Status
1	RDA Demonstration Farm	Irrigation, Drinking, Domestic and others	Operational
2	Bridge End Facilities (East), Bangabandhu Bridge Area	Drinking and Domestic Use	"
3	Engineer's Facilities (Alenga), Bangabandhu Bridge Area	Drinking and Domestic Use	"
4	Engineer's Facilities (Nalka), Bangabandhu Bridge Area	Drinking and Domestic Use	"
5	Resettlement Village (East), Bangabandhu Bridge Area	Drinking and Domestic Use	"
6	Resettlement Village (West), Bangabandhu Bridge Area	Drinking and Domestic Use	"
7	Proshika Training Centre, Kytta, Manikganj	Drinking and Domestic Use	"
8	Shamsuddin Spinning Mills Ltd., Gazipur	Industrial use	"
9	Mahasthan Mazar, Bogra	Drinking and Domestic Use	"
10	Baghabari GT Power Station, Sirajgonj	Drinking and Domestic Use	"
11	Jamuna Fertilizer Company Premises, Tarakandi, Jamalpur	Industrial use	Not yet started
12	Nichintapur, Nalitabari, Sherpur	Irrigation, Drinking, Domestic and others	"
13	Gulbahar, Kachua, Chandpur	Irrigation, Drinking, Domestic and others	"
14	Baraipara, Sariakandi, Bogra	Irrigation, Drinking, Domestic and others	"
15	Poragaon, Nalitabari, Sherpur	Irrigation, Drinking, Domestic and others	"
16	Kalsamati, Sherpur, Bogra	Irrigation	Operational
17	Sakhipur, Kachua, Chandpur	Irrigation	Not yet started

Quality of water obtained from any source is of equal importance to its quantity. Water quality criteria for its various uses (e.g. drinking, irrigation, industry, livestock, etc) is considered as an essential factor in selecting and constructing a DTW. For this reason water samples are collected from the main aquifer during each of the test boring and final drilling of wells and analysed in order to know its suitability for the desired uses of DTWs. If the quality of water does not permit the desired requirement, selection of DTW is not feasible in many cases though the aquifer formation remains excellent. However, under such cases treatment plants are necessary to purify water which adds extra cost involvement. Considering this fact, water sample for each of the RDA developed DTW has been collected and tested by field kits as well as in the laboratory for determining its suitability according to its use.

During drilling of RDA developed DTWs water samples from various depths were collected and in-situ tests were made by tool kits in order to assess quality (particularly Arsenic, Iron, Manganese, etc) which is also considered as criteria in designing DTW along with the lithology. Out of 17 DTW locations, Arsenic contaminated water was detected at 3 sites namely, Kachua, Chandpur and Sariakandi, Bogra during drilling. In order to overcome this problem and to identify safe aquifer formation drillings were carried out at deeper depths and the DTWs were then designed according to safe aquifer formation.

5. Major Findings of the Study

RDA developed DTW has shown the following advantages over the traditional DTW

1. DTW cost reduces 30 to 40% of traditional DTW having capacity ranges from 0.22 to 56 lirte/sec and the total cost ranges from Tk. 0.06.00 to 5.00 lacs.
2. DTW has been designed according to demand.
3. Total drilling system from test boring to drilling of main production well is manual. No need of traditional rig method.
4. Multiple use of DTW like irrigation, drinking, domestic use industries, fisheries, livestock and so on.
5. In the traditional DTW (M.S housing and stainless steel strainer) is being used. But in case of RDA tubewell PVC pipe and G.I sheet is being used for strainer and housing pipe.
6. The economic life of the DTW is expected to be about 25 years.

6. Conclusions and Recommendations

RDA developed DTW model is based on the concept that the DTW is not only an equipment of water abstraction, but it also help in infrastructure development (i.e. installation of well, pump and pumping plant), water distribution network for its multipurpose uses as well as on-farm water management practices in the field. Every technology, either simple or sophisticated, has its some inherent limitations. RDA developed DTW technology cannot be an exception to it. Some constraints are experienced during its adoption in the real situation which were

mostly man created and outcome of local circumstances. The RDA developed DTW model is a newly innovated technology and it has not yet been widely adopted in the field. So, the constraints which may arise out of application of this new technology are yet to be known.

From the research findings (Matin et al. 2000) it is found that all the RDA developer DTWs under operation at different locations in the country are running well without any major problem. As the DTWs have been started operating since last two years and some of them are going to be commissioned very soon, more investigations and in-depth analysis regarding performance evaluation and workability will confirm replication of this model in different agro-ecological zones of the country.

Government and NGO may come forward for replicating this type of model as pilot basis. If this model is replicated in all over Bangladesh that would be help for command area development as well as overall agricultural as well as multipurpose uses This model may also be replicated in those countries where similar problem exists.

References

AST/CIDA (1991), *Census of lift irrigation. Bangladesh - Canada Agricultural Sector Team Report,* Ministry of Agriculture, Government of the People's Republic of Bangladesh, Dhaka.

Ministry of Planning (1999), *Fifth Five Year Plan*, Planning Commission, Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka.

Matin, M. A. et al. (2000), *Performance of RDA Developed Low-Cost DTW Technology for Multipurpose Uses : An Evaluation Paper* (presented in the National Seminar held in 19 October, 2000), Rural Development Academy, Bogra, Bangladesh.

NMIDP (1998), *National Minor Irrigation Census 1996/97*, Ministry of Agriculture, Government of the People's Republic of Bangladesh, Dhaka.

ISSN 1019 - 9624
The Bangladesh Rural Development Studies Vol. X No. 1 (2002)

ক্ষুধা জয়ে তারুণ্য

সমীর কুমার সরকার[১]
এস এম কামরুল হাসান[২]

ভূমিকা

মানব সভ্যতা বিকাশের পর থেকে যুগে যুগে মানবকুল ক্ষুধার বিরুদ্ধে সোচ্চার ভূমিকা পালন করে আসছে। পৃথিবীর বিভিন্ন দেশের নিজস্ব পারিপার্শ্বিক অবস্থার পরিপ্রেক্ষিতেই বিভিন্ন সময়ে ক্ষুধা/দারিদ্র্য নিরসনের জন্য তারা বিভিন্ন পন্থা অবলম্বন করেছেন। বিশ্বের জনসংখ্যা দ্রুত গতিতে বাড়ছে। সেই সংগে তীব্র থেকে তীব্রতর হচ্ছে বিশ্বের খাদ্য সংকট। এই সংকটাপন্ন অঞ্চলের মাঝে উন্নয়নশীল এবং দরিদ্র দেশগুলোই অধিকহারে খাদ্য ঘাটতির শিকার। খাদ্য প্রাচুর্যের মাঝে বসবাসকারী উন্নত দেশসমূহের ১৮০ কোটি জনসাধারণের পাশাপাশি দাঁড়িয়ে আছে বিশ্বের ৪২০ কোটি ক্ষুধা পীড়িত মানুষ। বিশ্বের শতকরা ৩০ ভাগ লোক শিল্পোন্নত দেশগুলোতে বাস করে কিন্তু তারা ভোগ করে মোট উৎপাদনের শতকরা ৫৫ ভাগ খাদ্য সম্ভার। বাকী ৭০ ভাগ লোকের অবশিষ্ট থাকে শতকরা ৪৫ ভাগ খাদ্য সামগ্রী। এর কারণ বহুবিধ - জাতীয় উৎপাদন হ্রাস, সীমিত ক্রয় ক্ষমতা, রাজনৈতিক ও সামাজিক অস্থিরতা, জনসংখ্যাধিক্যের পাশাপাশি শিক্ষার অভাব তথা উন্নত প্রযুক্তির ব্যবহারের অভাবকে মূলতঃ দায়ী করা যায়। ফলশ্রুতিতে দারিদ্র্যের দুষ্ট চক্র (Vicious Circle of Poverty) থেকে বের হয়ে আসা কঠিন থেকে কঠিনতর পর্যায়ে উপনীত হচ্ছে। (জাহাংগীর, এ, ১৯৯৮)।

বিশ্বের উন্নয়নশীল ও অনুন্নয়নশীল দেশসমূহের বেশীরভাগ জনসাধারণ দারিদ্র্য সীমার নীচে জীবন ধারণ করে যা কিনা অন্য কথায় ক্ষুধা নিয়ে দিন যাপন করে থাকে। এর অন্যতম কারণ

---

[১] সহকারী পরিচালক, পল্লী উন্নয়ন একাডেমী, বগুড়া।
[২] যুগ্ম-পরিচালক পরিচালক, পল্লী উন্নয়ন একাডেমী, বগুড়া।

হলো ক্রমবর্দ্ধমান হারে জনসংখ্যার বৃদ্ধি। বর্তমান অবস্থায় এশিয়া ও আফ্রিকা মহাদেশের অধিকাংশ দেশসমূহে বেশীরভাগ দরিদ্র জনসাধারণের বসবাস হওয়ায় এবং জনসংখ্যার পরিমাণ অধিক হওয়ায় এখানে ক্ষুধা-জাঁকিয়ে বসে আছে। কোন একটি দেশে ক্ষুধার সমস্যা হিসেবে প্রধানতঃ যে সকল কারণ চিহ্নিত করা যায় তা হলোঃ

১) অধিক জনসংখ্যা ও জনসংখ্যা বৃদ্ধির হার বেশী।
২) খাদ্য শষ্যের উৎপাদন হার কম।
৩) জনসাধারণের শিক্ষার হার কম।

ভৌগলিক সীমার মধ্যে একটি দেশে যে পরিমাণ জনগণ থাকলে খাওয়া-পরার কোন সমস্যা হয় না তা হলো কাংখিত জনসংখ্যা। কোন দেশে যদি কাংখিত জনসংখ্যার চেয়ে অধিক জনসংখ্যা থাকে তাহলে সে দেশের জনসংখ্যার একটি অংশ অবশ্যই ক্ষুধা নিয়ে বসবাস করতে বাধ্য। ১২ অক্টোবর'৯৯ সালে বিশ্বের জনসংখ্যা ৬০০ কোটি হয়েছে এবং বাংলাদেশের জনসংখ্যা ইতোমধ্যে ১২.৭০ কোটিতে দাঁড়িয়েছে। বর্তমান উৎপাদন প্রযুক্তির আওতায় বিশ্বের তথা বাংলাদেশে জনগণের জন্য খাদ্য নিরাপত্তা প্রদান অসম্ভব হয়ে দাঁড়িয়েছে। সুতরাং দেশের জনগণের ক্ষুধা মিটানোর জন্য জনসংখ্যা বৃদ্ধির হারকে অবশ্যই কাংখিত মাত্রায় রাখার কার্য্যকরী পদক্ষেপ গ্রহণ করতে হবে।

জনসংখ্যা নিয়ন্ত্রণের সাথে সাথে দেশের খাদ্য উৎপাদন বৃদ্ধি করা দরকার। উন্নত দেশসমূহে ক্ষুধা তথা খাদ্য নিয়ে তেমন চিন্তা না থাকলেও উন্নয়নশীল দেশসমূহে এটা এখন জরুরী ও প্রধান বিষয় হিসেবে গুরুত্ব দেয়া হয়ে থাকে। কৃষি উৎপাদন বৃদ্ধির জন্য প্রযুক্তি উদ্ভাবন ও ব্যবহার যথাযথভাবে করার প্রয়োজনীয় পদক্ষেপ নেয়া দরকার। বিশেষজ্ঞগণের মতে বর্তমান প্রযুক্তিতে ২০১৫ সালের পর দু' একটি দেশ এবং বিশেষ করে আমেরিকা ছাড়া মোটামুটি সকল দেশের পক্ষেই আর খাদ্য রপ্তানী করা সম্ভব হবে না। সুতরাং খাদ্য নিরাপত্তা অর্জনে যেমন অধিক আয় দ্বারা খাদ্য আমদানী করে খাদ্যের যোগান বৃদ্ধির কথা বলা হয়েছিল তা সীমাবদ্ধ হয়ে পড়বে অর্থাৎ টাকা থাকলেও খাদ্য বিক্রেতা পাওয়া সম্ভব হবে না। তাই উন্নত

বিশ্ব খাদ্য ঘাটতি দেশসমূহে যতশীঘ্র সম্ভব তাদেরকে খাদ্যে স্বনির্ভরতা অর্জন করতে পরামর্শ দিচ্ছে।

জনসংখ্যা নিয়ন্ত্রণ ও খাদ্য উৎপাদন বৃদ্ধির পাশাপাশি দেশের শিক্ষিতের হারকে ১০০% এ উন্নীত করা প্রয়োজন। কারণ জনসংখ্যা নিয়ন্ত্রণ কিংবা খাদ্য উৎপাদন বৃদ্ধি করলেই হয়ত সাময়িকভাবে ২/১ বৎসরের জন্য ক্ষুধা বিমোচন করা সম্ভব হলেও হতে পারে। কিন্তু ক্ষুধা বিমোচনকে দীর্ঘস্থায়ী করতে হলে খাদ্যের পুষ্টিমান ও বহুমুখী ব্যবহারের কৌশল অর্জন করা দরকার। উদাহরণ স্বরূপ বলা যায় একজন পূর্ণ বয়স্ক মানুষের গড়ে ২৮০০ কিলোকালরী পুষ্টি দরকার এবং এ কিলোকালোরী ৫০-৬০% শর্করা, ১০-১২% চর্বি এবং অবশিষ্ট ২০-৩০% পুষ্টি শাক-সব্জি ও ফলমূল থেকে সংগ্রহ করতে হবে। এখন জনসাধারণ শিক্ষিত হলে এগুলো পুষ্টিমানের উৎসের পরিবর্তন ও সমন্বয়ের মাধ্যমে খাদ্য ঘাটতি মিটাতে পারে যা একজন অশিক্ষিতের পক্ষে সম্ভব নয়। এভাবে খাদ্য ঘাটতি পুরণের কথা চিন্তা করলে বাংলাদেশ কেন বিশ্বের অনেক দেশই এমুহূর্তেই খাদ্যে স্বনির্ভরতা অর্জন করেছে বলা যেতে পারে।

দেশের জনসংখ্যা নিয়ন্ত্রণ হোক, খাদ্য উৎপাদন বৃদ্ধি হোক কিংবা দেশের শিক্ষিতের হার উন্নীতকরণ হোক প্রতি ক্ষেত্রেই দেশের যুব সম্প্রদায় অতপ্রতোভাবে জড়িত। জনসংখ্যা নিয়ন্ত্রণে যুব সম্প্রদায় হলো আগামী দিনের দম্পতি। সুতরাং জনসংখ্যা বৃদ্ধির সমস্যা সম্পর্কে তাদেরকে উদ্বুদ্ধ করা হলে তারা কার্য্যকর ভূমিকা রাখতে পারবে। অনুরূপভাবে খাদ্য উৎপাদনের কথা চিন্তা করলে কৃষি কাজ হলো কায়িক শ্রমবহুল এবং একাজে যুবকরাই উপযুক্ত। সুতরাং এক্ষেত্রে শিক্ষিত যুব সমাজ উন্নত প্রযুক্তি ব্যবহার করে খাদ্য উৎপাদন বৃদ্ধিতে প্রত্যক্ষ অবদান রাখতে পারবে। বাংলাদেশের খাদ্য পরিস্থিতির একটি ছক নিম্নে প্রদত্ত হলোঃ

খাদ্য পরিস্থিতি

আনন্দের সংবাদ ১৯৯৯ সালে কৃষিতে বাম্পার ফলন হেতু (২ কোটি ১৩ লক্ষ মেট্রিক টন) জাতিসংঘের খাদ্য ও কৃষি সংস্থা (FAO) বাংলাদেশের মাননীয় প্রধান মন্ত্রী, শেখ হাসিনাকে *"*সেরেস স্বর্ণ"* পদকে ভূষিত করেছে। কিন্তু ১৯৯৫-৯৬ এবং ১৯৯৬-৯৭ সালে খাদ্য শস্যের জনপ্রতি দৈনিক গড় প্রাপ্যতা পূর্ববর্তী বছরের ৪১৫.৬৩ গ্রাম এর তুলনায় ৪.৮৯ গ্রাম অর্থাৎ শতকরা ১.২ ভাগ বৃদ্ধি পেয়ে ৪২০.৫২ গ্রামে দাঁড়ায়। খাদ্য শস্যের মোট ও জনপ্রতি দৈনিক গড় প্রাপ্যতার বিবরণ নিম্নরূপ ঃ

সারণী - ১ ঃ বাংলাদেশের খাদ্য শস্যের মোট ও জনপ্রতি দৈনিক গড় প্রাপ্যতা

(লক্ষ টন)

খাদ্য প্রাপ্যতার উৎস	১৯৯৫-৯৬	১৯৯৬-৯৭	পরিবর্তন
১। নীট আভ্যন্তরীণ উৎপাদন (শতকরা ১০ ভাগ বীজ, গো-খাদ্য ও অপচয় বাদে)	১৭১.৫০	১৮৩.০৩	+ ১১.৫৩ (+৬.৭২)
২। সরকারী গুদাম থেকে বিতরণ	১৭.৯৫	১৩.৯২	- ৪.০৩ (-২২.৪৫)
৩। অভ্যন্তরীণ সংগ্রহ	৪.২২	৬.১৬	+১.৯৪ (+৪৫.৯৭)
৪। মোট প্রাপ্যতা (১+২-৩)	১৮৫.২৩	১৯০.৭৯	+৫.৫৬ (+৩.০০)
৫। মোট জনসংখ্যা (মিলিয়ন)	১২২.১০	১২৪.৩০ সা	+ ২,২০ (১.৮০)
৬। জনপ্রতি দৈনিক গড় প্রাপ্যতা (গ্রাম)	৪১৫.৬৩	৪২০.৫২ সা	+ ৪.৮৯ (+১.১৮)

নোট ঃ বন্ধনীর সংখ্যাসমূহ শতকরা পরিবর্তন নির্দেশক
উৎস ঃ (১) খাদ্য মন্ত্রণালয় এবং (২) বাংলাদেশ পরিসংখ্যান ব্যুরো।
সা = সাময়িক, * সেরেস (রোমান খাদ্য দেবী)।

প্রসঙ্গ কথা ঃ

বাংলাদেশের প্রেক্ষাপটও বিশ্বের অন্যান্য উন্নয়নশীল দেশগুলোর মতোই; বরং আরো জটিল। খাদ্য ঘাটতির চেয়ে পুষ্টি ঘাটতির হার এখানে অনেক বেশী। কারণ আমরা ভাত খাই; কিন্তু খাদ্য খাই না। আমাদের দৈনন্দিন খাদ্য তালিকায় মাছ, মাংস, ডিম, দুধ এবং ফলমুল ও সব্জির পরিমাণ এতই নগণ্য যে একে খাদ্য বলা চলে না। ফলে একদিকে যেমন আমাদের খাদ্যের চাহিদা বাড়ছে , সাথে সাথে বাড়ছে পুষ্টি সংকট ।

একজন আমেরিকান দৈনিক ৩ কেজি শস্য ব্যবহার করেন। এর এক তৃতীয়াংশ(১/৩) নিজে খায় ও রপ্তানী করে। বাকী দুই-তৃতীয়াংশই গবাদিপশু ও পাখীকে খাওয়ায়। বিনিময়ে সে লাভ করে উন্নত ধরণের খাদ্য, যেমন দুধ, মাংস, ডিম ইত্যাদি। আর আমাদের দেশে পশু পাখীকে খাওয়ানো তো দূরের কথা নিজেরাই উপোষ থাকি। ফলে পশু- পাখীও আমাদেরকে বঞ্চিত করে। দুধ, ডিম ও মাংসের অভাবে আমাদের খাদ্য হয় নিম্নমানের। কিন্তু খাদ্য শস্য যেমন চাউল, গম থেকে শুধু শর্করা বা কার্বোহাইড্রেট জাতীয় উপাদান মিলে। প্রোটিন (আমিষ) ও চর্বি জাতীয় উপাদান মিলেনা। এরই জন্য উন্নত দেশের জনগণ মাথা পিছু দৈনিক প্রায় ৮৪ গ্রাম আমিষের মধ্যে ৪০ ভাগই গ্রহণ করে প্রাণীজ প্রোটিন, আর আমাদের মাথাপিছু ৫০ গ্রাম খাদ্যের মধ্যে প্রাণীজাত প্রোটিনের পরিমাণ মাত্র ৭.২ গ্রাম, ফলে পুষ্টি সংকটের আবর্তে রোগ প্রতিরোধ ক্ষমতা কমছে। কমে আসছে কর্মক্ষমতা।

খাদ্য সমস্যার কথা ছেড়ে দিলেও দেহ ও মনের সুস্থ বিকাশ এবং স্নায়ু কেন্দ্র গঠনের জন্যে প্রয়োজন সুষম খাদ্য। মানুষ ও প্রাণীর মধ্যে যে জৈবিক ব্যবধান রয়েছে তার মধ্যে সব থেকে গুরুত্বপূর্ণ হলো মানুষের মস্তিষ্ক। তাই মানুষ হয় যুক্তিবাদী, সহনশীল, সামাজিক এবং নীতিবোধ সম্পন্ন প্রাণী। কিন্তু এই মস্তিষ্কের গঠন যদি সম্পূরক না হয় তাহলেই দেখা দেয় অমানবিক আচরণ। সন্তান যখন মায়ের গর্ভে থাকে তখন সে মায়ের রক্ত থেকেই আহরণ করে তার শরীর গঠনের যাবতীয় উপাদান, যখনই মায়ের রক্তে শিশুর শরীর গঠনের প্রয়োজনীয় কোন উপাদানের অভাব হয় (যা খাদ্য থেকে মা আহরণ করেন) তখন গর্ভজাত শিশুর মস্তিষ্কের স্নায়ুকেন্দ্র, শরীরের বিভিন্ন অংগ ও গ্রন্থিগুলোর পরিপূর্ণ বিকাশ হয় না। শিশু জন্মগ্রহণ করে একটি অপূর্ণ ও ত্রুটিযুক্ত গঠন প্রকৃতি নিয়ে। তাই মাতৃগর্ভ থেকে শুরু করে জন্ম গ্রহণোত্তর শিশু থেকে কৈশর, কৈশর থেকে যুব এবং যুব থেকে পূর্ণ মানুষ প্রতিটি ক্ষেত্রেই প্রয়োজন হয় সুষম খাদ্য। এর ব্যত্যয় ঘটলে কর্মী ও যুক্তিবাদী মানুষ হিসেবে চলার কোন উপায় থাকে না। তাই বাংগালী জাতি সম্পূরক খাদ্যের অভাবে হতে চলেছে ছোট আকৃতির, অলস ও দূর্বল স্নায়ুকেন্দ্র বিশিষ্ট জাতি হিসেবে। এই বিরাট ধ্বংসের হাত হ'তে জনতাকে রক্ষা পেতে হলে আমাদের দৈনন্দিন খাদ্য তালিকায় ভাতের পাশাপাশি প্রচুর দুধ, ডিম,মাছ, মাংস, শাক-সব্জি ও ফলজাতীয় খাদ্যের সমাবেশ প্রয়োজন। আর এই প্রয়োজন মিটাতে অগ্রণী তথা মূখ্য ভূমিকা রাখতে পারে প্রতি দেশের অগণিত যুব সম্প্রদায়। যাদের অদম্য কর্ম তৎপরতা একটি জাতি তথা বিশ্বের চালিকা শক্তি হিসেবে চিহ্নিত করা যায়। কেননা আজকের যুবশক্তি আগামী দিনের পূর্ণ মানব শক্তিতে পরিণত হবে।

তাই এবারের (১৯৯৯) প্রতিপাদ্য বিষয় যুবশক্তিকে ঘিরে আবর্তিত হওয়ায় এর গুরুত্ব অনেকাংশে বেড়ে গেছে বলে প্রতীয়মাণ হয়। এবারের প্রতিপাদ্য বিষয় **ক্ষুধা জয়ে তারুণ্য** (Youth Against Hunger) বিশ্বের বর্তমান প্রেক্ষাপটে বিশেষ করে বাংলাদেশের ক্ষেত্রে *'যথার্থ'* হয়েছে বলা যায়।

তারুণ্য

প্রধানতঃ তারুণ্য/যুব কে নিম্নে তিনটি ভিত্তিতে চিহ্নিত করা হয়েছেঃ

১) নির্দিষ্ট বয়সের উপর ভিত্তি কের।

২) জীবন স্তরের উপর ভিত্তি করে এবং

৩) মনোবৃত্তির উপর ভিত্তি করে।

১। নির্দিষ্ট বয়সের উপর ভিত্তি করে (As a particular age group)

জাতিসংঘের সাধারণ পরিষদ ১৯৮৫ সালে এ সিদ্ধান্তে উপনীত হয় যে, মানবকুলে যাদের বয়স ১৫ থেকে ২৪ বছরের মধ্যে তারা হবে যুব সম্প্রদায়। তবে এটি দেশ, কাল, পাত্র ভেদে বিভিন্ন হতে পারে।

২। জীবন স্তরের উপর ভিত্তি করে (As a stage in life)

মানুষ যখন পাঠক্রম থেকে কাজের জন্য; শিশু থেকে পিতা-মাতা বা পরিবারের নির্ভরশীলতা থেকে পরিবারের প্রধান হিসেবে ভূমিকা রাখে তখন তাকে তরুণ / যুব হিসেবে চিহ্নিত করা যায়।

৩। মনোবৃত্তির উপর ভিত্তি করে (As an attitude)

মানুষ যখন আশাবাদী, সহজগ্রাহ্য, পরিবর্তনকে গ্রহণ করে নির্ভীকতা ও স্বাচ্ছন্দের সাথে এবং তার আদর্শবাদিতায় বিশ্বাস করে তখন তাকে তরুণ বলে।

সারণী - ২.১ ঃ বিশ্বে তরুণদের বিন্যাস

সন	সংখ্যা (মিলিয়ন)	মোট জনসংখ্যায় তরুণদের অংশ (%)
১৯৮৫	৯৪১	২০
১৯৯৫	১০৩০	১৭.৬
২০২৫	১৩৬০	১৬

উৎস ঃ United Nations World Population Prospects 1990 (ST/ESA/SER,A/120), p, 226.

সারণী - ২.১ থেকে দেখা যায় যে, ১৯৮৫ সালে বিশ্বে তরুণদের সংখ্যা ছিল ৯৪১ মিলিয়ন এবং ক্রমাগত বৃদ্ধি পেয়ে ১৯৯৫ সালে তা দাঁড়ায় ১০৩০ মিলিয়নে কিন্তু ২০২৫ সাল নাগাদ তা গিয়ে দাঁড়াবে ১৩৬০ মিলিয়নে অর্থাৎ তরুণদের বৃদ্ধি হার ক্রমাগতভাবে নিচের দিকে যাচ্ছে।

বর্তমানের তরুণ সমাজ ক্ষুধা জয়ে এক বিরাট ভূমিকা রাখতে পারে। বাংলাদেশে প্রায় ৪ কোটি বেকার যুব পুরুষ ও মহিলা রয়েছে। এর মধ্যে শিক্ষিত বেকারের সংখ্যা প্রায় এক কোটি; এদেরকে সুপরিকল্পিতভাবে কাজে লাগাতে হবে (এম,এন, ইসলাম, ১৯৯৭)।

সারণী - ২.২ ঃ বিশ্বে তরুণদের অবস্থানগত বিন্যাস

	অঞ্চল	বিশ্বের মোট তরুণদের সংখ্যায় অবস্থান (%)
১.	সমস্ত উন্নত বিশ্ব	১৬
২.	সমস্ত ল্যাটিন আমেরিকা এবং ক্যারিবিয়ান অঞ্চল	৯.২
৩.	পূর্ব এশিয়া	২৩.০
৪.	দক্ষিণ মধ্য এশিয়া	২৫.৪
৫.	পশ্চিম এশিয়া	৩.২
৬.	দক্ষিণ পূর্ব এশিয়া	৯.৫
৭.	সাব-সাহারিয়ান আফ্রিকা	১০.৫
৮.	উত্তর আফ্রিকা	৩.১
৯.	ওশেনিয়া অঞ্চল	০.১
		১০০

উৎস ঃ United Nations Statistical Divisions from Demographic Year Book, 1996 (UN Publication, Sales No. E/F, 1998 XIII.I)

Note :
Eastern Asia : Only Hong Kong SAR of China and Macau
South Eastern Asia : Only Indonesia, Myanmar, Singapore and Thailand
South Central Asia : Only Bangladesh, Iran and Pakistan.

বিশ্ব তরুণ সমাজের ৮৫% বাস করে উন্নয়নশীল দেশসমূহে এবং তার অর্ধেকেরও বেশী পল্লী অঞ্চলের বাসিন্দা। এই বিপুল সংখ্যক তরুণদের সুষ্ঠুভাবে কাজে লাগাতে পারলে **"ক্ষুধা জয়ের"** প্রতিপাদ্য বিষয়টি বাস্তবের মুখ দেখতে পাবে বলে আশা করা যায়।

এবার দেখা যাক, যে তরুণ সমাজকে নিয়ে **"ক্ষুধা জয়ের"** মত কঠিন পথ পাড়ি দিতে হবে তাদের বর্তমান সামাজিক সমস্যাগুলি কিরূপ - FAO প্রতিবেদনে উল্লেখ রয়েছে নিম্নভাবে -

১।	আগাম বিবাহ ও মাতৃত্বধারণ	- ৩১%	(Early marriage and child bearing)
২।	শিক্ষার অভাব	- ৩১%	(Lack of education)
৩।	ড্রাগ এবং নেশা গ্রস্থ	- ২৫%	(Drug and substance abuse)
৪।	পারিবারিক সমস্যা	- ২১%	(Family problems)
৫।	যৌনবাহিত রোগাক্রান্ত/এইডস	- ২১%	(Sexually transmitted diseases/HIV)
৬।	বেকারত্ব	- ১৭%	(Unemployment)
৭।	উপযুক্ত সুযোগের অভাব	- ১৫%	(Lack of proper opportunity)

- ❑ বিশ্বে প্রতিদিন ৭০০ জন তরুণ (১৫ - ২৪ বছর) এইচআইভি দ্বারা আক্রান্ত হচ্ছে (AIDS)
- ❑ এক তৃতীয়াংশেরও বেশী ৩৩৩ মিলিয়ন তরুণ প্রতিবছর যৌন বাহিত রোগে আক্রান্ত হচ্ছে।
- ❑ ১/৩ অংশ যুব মহিলা অপ্রাপ্ত বয়সে মাতৃত্ব লাভ করছে।
- ❑ প্রতি বছর ১,০০,০০০ (এক লক্ষ) তরুণ বিভিন্ন কারণে আত্মহত্যা (Suicide) করছে
- ❑ ৩০০ মিলিয়ন তরুণ ধূমপানে আসক্ত

উৎস ঃ World Programme of Action for Youth to the Year 2000 and Beyond (UN, 1995)

বিশ্ব প্রেক্ষিত

বাংলাদেশ দক্ষিণ এশিয়ায় অবস্থিত একটি উন্নয়নশীল দেশ। তাই প্রাথমিকভাবে দক্ষিণ এশিয়ার সঠিক চিত্রের সাথে পৃথিবীর একটি তুলনামূলক চিত্র এখানে তুলে ধরার প্রয়াস নেয়া হয়েছে। এটা আজ ব্যাপকভাবে স্বীকৃত যে, উন্নয়নের প্রকৃত উদ্দেশ্য হতে হবে জনগণের বেছে নেবার অধিকারগুলোকে প্রসারিত করা। জিএনপি'র বৃদ্ধি এ উদ্দেশ্য বাস্তবায়নে একটা উপায় মাত্র। উন্নয়নের চূড়ান্ত অভীষ্ট লক্ষ্য হচ্ছে মানব সামর্থ নির্মাণ এবং মানব সুযোগগুলো প্রসারিত করা। মানব উন্নয়নের বিকাশমান এ ধারণাটি দক্ষিণ এশিয়ায় আজ সবচেয়ে গুরুত্বপূর্ণ পরীক্ষার সম্মুখীন। এ অঞ্চলটি মানবজাতির প্রায় ৫ ভাগের ১ ভাগ ধারণ করে। দক্ষিণ এশিয়া দ্রুতগতিতে বিশ্বের সবচেয়ে গরীব,

নিরক্ষর ও পুষ্টিহীন এবং কম লিঙ্গ সংবেদনশীল; বস্তুতঃপক্ষে সর্বাপেক্ষা বঞ্চিত অঞ্চল হিসেবে আবির্ভূত হচ্ছে। তথাপী আঞ্চলটি জনগণের শিক্ষা ও স্বাস্থ্যের চেয়ে অস্ত্রে অধিকতর বিনিয়োগ করে চলেছে। কিন্তু দুঃখজনক যে, ব্যাপারটি আজও এ অঞ্চলের নীতিনির্ধারক বা আন্তর্জাতিক সম্প্রদায়ের কাছে তেমন একটা গুরুত্ব পাচ্ছে না।

সারণী-৩ থেকে সুস্পষ্টভাবে প্রতীয়মান হয় যে, একমাত্র যে ক্ষেত্রটিতে দক্ষিণ এশিয়া বেশ অগ্রগতি অর্জন করেছে তা হলো জনসংখ্যা বৃদ্ধিতে। যেমন, ১৯৬০ সালে বিশ্বের মোট জনসংখ্যায় দক্ষিণ এশিয়ার অংশ ছিল ১৯ শতাংশ, আর ১৯৯৩ সালে বৃদ্ধি পেয়ে দাঁড়িয়েছে ২২ শতাংশে। ১৯৬০ সালে পৃথিবীর প্রকৃত জিডিপি'তে (পিপিপি বা ক্রয় ক্ষমতা সমতা, ডলারে) যেখানে দক্ষিণ এশিয়ার অবদান ছিল ৬.৯ শতাংশ, ১৯৯৩ সালে তা নেমে এসেছে ৫.৩ শতাংশে। বিশ্ব ব্যাংকের হিসাব অনুযায়ী আরো জানা যায় যে, ১৯৯৩ সালে প্রবৃদ্ধিজনিত এ মন্থরতার কারণে দক্ষিণ এশিয়ায় ৫০০ মিলিয়ন লোক চরম দারিদ্র্যের মধ্যে বাস করছিল।

জনসংখ্যা বৃদ্ধি ও প্রকৃত জিডিপি কমে যাবার পাশাপাশি এ অঞ্চলটিতে প্রাপ্ত বয়স্ক নিরক্ষর জনসংখ্যার অংশ বেড়ে যায় - ১৯৬০ সালের ৩২ শতাংশ থেকে ১৯৯৩ সালে ৪৬ শতাংশ। কাজেই এ অঞ্চলে শুধু নিরক্ষর মানব বঞ্চনার দিকটিই উদ্বেগময় নয়। দক্ষিণ এশিয়া যে মানব উন্নয়নের প্রতিযোগিতায় পৃথিবীর অন্যান্য অঞ্চলের পিছনে পড়া শুরু করেছে কেবল এ সংবাদটুকু এ অঞ্চলের নীতি নির্ধারক মহলে তুলে ধরার জন্য এবারের বিশ্বখাদ্য দিবসের প্রতিপাদ্য বিষয় গুরুত্বপূর্ণ ভূমিকা রাখতে সক্ষম হবে বলে বিশ্বাস।

সারণী-৩ ঃ বিশ্ব প্রেক্ষিতে দক্ষিণ এশিয়া

	জনসংখ্যা (মিলিয়ন)		প্রকৃত জিডিপি (পিপিপি, ডলার, বিলিয়ন)		চরম দারিদ্র (মিলিয়ন)		নিরক্ষর বয়স্ক জনসংখ্যা (মিলিয়ন)	
	১৯৬০	১৯৯৩	১৯৬০	১৯৯৩	১৯৬০	১৯৯৩	১৯৬০	১৯৯৩
পৃথিবী	২,৯৯৬	৫,৫০৮	৫,৩০৩	৩০,৫৪২	পাওয়া যায়নি	১,৩১৪	৭৩৫	৮৫৩
দক্ষিণ এশিয়া	৫৬৪	১,১৯১	৩৬৫	১,৬৩২	পাওয়া যায়নি	৫২৭	২৩৪	৩৯৬
পৃথিবীতে দক্ষিণ এশিয়ার অংশ (%)	১৯	২২	৬.৯	৫.৩	পাওয়া যায়নি	৪০	৩২	৪৬

উৎস ঃ UN 1994; UNESCO 1995; World Bank 1995, 1996.

জনসংখ্যা

বিশ্বপ্রেক্ষিত

১৯৯৯ সালের ১২ অক্টোবর বিশ্ব জনসংখ্যা উপনীত হয়েছে ৬০০ কোটিতে। মাত্র ১২ বছরে ১০০ কোটি যুক্ত হয়েছে। মোট জনসংখ্যার অর্ধেক হলো ২৫ বছরের নিচে, যার মধ্যে ১০০ কোটির অধিক জনসংখ্যার বয়স ১৫-২৪ বছর অর্থাৎ আজকের তরুণ সমাজ আগামী প্রজন্মের পিতামাতা। বিশ্ব জনসংখ্যা এ শতাব্দীতে ৪ গুণ বেড়েছে। এ শতাব্দীর শুরুতে বিশ্ব জনসংখ্যা হিসেবে প্রায় ১৫০ কোটি, ১৯২৭ সালে ২০০ কোটি, তারপর ১৯৬০ সালে ৩০০ কোটি, ১৯৭৪ সালে ৪০০ কোটি এবং ১৯৮৭ সালে ৫০০ কোটি। ১৯৯৯ সালের ১২ অক্টোবর বিশ্বে জনসংখ্যা উপনীত হয়েছে ৬০০ কোটিতে, আশঙ্কা করা হচ্ছে ২০৫০ সালে এর পরিমাণ হবে ৮৯০ কোটি। জনসংখ্যার ৯৫% বেড়েছে উন্নয়নশীল দেশসমূহে। অথচ ইউরোপ, উত্তর আমেরিকা এবং জাপানে জনসংখ্যা শুধু স্থিতিশীল হয়নি হ্রাস পেয়েছে। বিশ্বে প্রতি বছর ৭.৮০ কোটি জনসংখ্যা বৃদ্ধি পাচ্ছে এবং প্রতিদিন এবৃদ্ধির সংখ্যা ৩ লক্ষ ৫৬ হাজার (দৈনিক জনকণ্ঠ, ১৩/১০/৯৯ ইং)।

বাংলাদেশ প্রেক্ষিত

বাংলাদেশে ১৯৫১ সালে জনসংখ্যার পরিমাণ ছিল ৪.১১ কোটি যা ১৯৯৯ সালে ১২.৭০ কোটিতে উপনীত হয়েছে। অর্থাৎ বিগত ৪৮ বছরে ৪ গুণেরও বেশী জনসংখ্যা বৃদ্ধি পেয়েছে। আগামী ৫০ বছরে আশংকা করা হচ্ছে এর পরিমাণ হবে প্রায় ২৪ কোটি। আমাদের দেশের মোট জনসংখ্যার ৩০ শতাংশ যুব। বাংলাদেশের জাতীয় যুব নীতিমালা অনুযায়ী ১৫-৩০ বছর বয়সীদের যুব বলে সংজ্ঞায়িত করা হয়েছে। সে মোতাবেক বাংলাদেশে প্রায় ৪ কোটি যুব সম্প্রদায় রয়েছে। বাংলাদেশ পরিবার পরিকল্পনা পদ্ধতি গ্রহীতা বৃদ্ধির ক্ষেত্রে উপকরণ সরবরাহ ও বিতরণে তৃতীয় বিশ্বে উদাহরণ সৃষ্টি করেছে। এ গ্রহীতার হার ৭% থেকে ৫১% বৃদ্ধির কারণে জনসংখ্যা বৃদ্ধির হার ৩% থেকে ১.৬% এ হ্রাস পেয়েছে। মোট প্রজনন হার প্রায় ৭% থেকে ৩.২% এ উপনীত হয়েছে। মানুষের গড় আয়ু ৫৯.২ বছরে উন্নীত হয়েছে। কিন্তু আমাদের আত্মতৃপ্তির সুযোগ নেই। কারণ বিশ্বে জনসংখ্যা বৃদ্ধির হার যখন ১.২%; গড় আয়ু ৬৬ বছর এবং পরিবার পরিকল্পনা গ্রহীতার হার ৬০% এর উর্দ্ধে, সে তুলনায় আমাদের সাফল্য উল্লেখযোগ্য নয়।

কায়রো সম্মেলন, বেজিং ডিক্লারেশন, নিউইয়র্ক সুপারিশমালায় জনসংখ্যা ও উন্নয়ন একীভূত করে দারিদ্র্য বিমোচন, নিরবচ্ছিন্ন অর্থনৈতিক প্রবৃদ্ধি, প্রজনন স্বাস্থ্য ও অধিকার, খাদ্য, নিরাপত্তা, মানব সম্পদ উন্নয়ন, মানব অধিকারের নিশ্চয়তা, শিক্ষার অধিকার, পরিবেশ সংরক্ষণের বিভিন্ন দিক সম্পর্কে আলোকপাত করা হয়েছে। আমাদের আজকের দিনের অঙ্গীকার হবে উক্ত দিক নির্দেশনা অনুসারে কর্মসূচী নির্ধারণ এবং "ক্ষুধা জয়ে তারুণ্য" এ প্রতিপাদ্যকে উপজীব্য করে তোলা।

মানব উন্নয়ন অভিজ্ঞতার যথোচিত অবস্থান বিন্যস্ত করার উদ্দেশ্যে বাংলাদেশের জন্য ব্যালেন্সশীট (বা জমা ও খরচের বিবরণ) সারণী-৪ এ উপস্থাপন করা হলো যাতে করে বাংলাদেশে বিরাজমান মানব উন্নয়ন ও মানব দুর্দশার একটি সংক্ষিপ্ত ধারণা পাওয়া যাবে।

সারণী-৪ ঃ মানব উন্নয়ন ব্যালেন্স শীট

বাংলাদেশ		
মানব অগ্রগতি (জমা)		মানব দুর্দশা (খরচ)
❑ ১৯৭০ এবং ১৯৯৩ সালের মধ্যে প্রাপ্তবয়স্ক সাক্ষরতার হার বেড়েছে ২৪% থেকে ৩৭%। ❑ প্রাথমিক বিদ্যালয়ে মোট তালিকাভূক্তি হার বেড়ে ৭৭% - তে দাঁড়িয়েছে।	শিক্ষা	❑ প্রাপ্ত বয়স্ক লোকদের দুই-তৃতীয়াংশ নিরক্ষর ❑ ২৯ মিলিয়ন শিশু প্রাথমিক বিদ্যালয় থেকে বিরত থাকছে।
❑ গত তিন দর্শকে প্রত্যাশিত আয়ু বেড়েছে ১৬ বছর	স্বাস্থ্য	❑ প্রতি ১২,৫০০ লোকের জন্য মাত্র একজন ডাক্তার
❑ গত দশ বছরে দৈনিক ক্যালরী যোগান (প্রয়োজনের অনুপাতে) বেড়েছে ৮৩% থেকে ৯৩%।	খাদ্য ও পুষ্টি	❑ পাঁচ বছর কম বয়সী মৃত্যুর দুই-তৃতীয়াংশের সাথে অপুষ্টির সম্পর্ক রয়েছে।
❑ গত দুই দশকে প্রজনন হার ৩০% কমেছে। ❑ জনসংখ্যা বৃদ্ধির হার ১৯৭০-১৯৮০ সময়ের ২.৮% থেকে হ্রাস পেয়ে ১৯৮০-৯০ সময়ে ২.১% দাঁড়িয়েছে।	জনমিতিক ভারসাম্য	❑ জনসংখ্যা ঘনত্ব ৮০০ জন (প্রতি বর্গ কিঃ মিঃ) যা অন্যান্য প্রধান দেশের চাইতে বেশী। পৃথিবীর সমস্ত মানুষকে যদি মার্কিন যুক্তরাষ্ট্রে স্থান দেয়া যায়, তবুও সেখানকার জনঘনত্ব বাংলাদেশের বর্তমান জনঘনত্বের চেয়ে কম থাকবে। ❑ শহরের মোট জনসংখ্যার অর্ধেক বস্তি অথবা অন-অনুমোদিত বসতিতে বাস করে।
❑ গত তিনদশক ৫ বছর কম বয়সী মৃত্যুর হার অর্ধেক কমানো সম্ভব হয়েছে।	শিশু	❑ ১৬ বছরের কম বয়স্ক ১৫ মিলিয়ন শিশু শ্রমিক হিসাবে শোষিত এবং ১২-১৬ বছরের ১০,০০০ শিশু বেশ্যাবৃত্তি গ্রহণে বাধ্য। ❑ অর্ধেক শিশু কম ওজন নিয়ে জন্মগ্রহণ করে যেখানে, অন্যান্য উন্নয়নশীল দেশে এর মাত্রা ১৯ শতাংশ।
❑ মহিলাদের ৬২% অর্থনৈতিকভাবে কর্মপরায়ন যা শুধুমাত্র দক্ষিণ এশিয়ার মধ্যেই সবচাইতে বেশী নয় বরং অন্যান্য উন্নয়নশীল দেশের গড়-পড়তা ৫০% এর চাইতে বেশী। ❑ আইন প্রণয়নের মাধ্যমে উচ্চতর বেসামরিক চাকুরীর ১১% মহিলাদের জন্য সংরক্ষিত রাখা হয়েছে।	মহিলা	❑ শ্রমশক্তিতে মহিলাদের অনুপাত বেশী হওয়া সত্ত্বেও মোট অর্জিত আয়ে মহিলাদের হিস্যা মাত্র এক চতুর্থাংশ। ❑ পুরুষদের তুলনায় মহিলারা সন্তুষ্টিকর পুষ্টির মাত্র ৮৮% গ্রহণ করে।
❑ দক্ষিণ এশিয়ার অন্যান্য দেশের তুলনায় আয়, সম্পদ কিংবা জমির ক্ষেত্রে অতিরিক্ত কেন্দ্রীকরণ প্রত্যক্ষ করা যায় না।	দরিদ্র ও আয়	❑ মোট জনসংখ্যার ৫২% চরম দারিদ্র্য সীমার নিচে বেঁচে থাকে।
❑ সৈন্যের চাইতে শিক্ষকের সংখ্যা তিনগুণ বেশী (শিক্ষক-সৈন্যের অনুপাত দক্ষিণ এশিয়ার মধ্যে সর্বোচ্চ)।	সামরিক রেখা	❑ একদশকেরও কম সময়ে সামরিক স্থাপনা (সর্ব প্রকারের, সর্বমোট সামরিক সরঞ্জাম) বেড়েছে ১২২ শতাংশ।

উৎস ঃ হক, মাহবুব উল (১৯৯৭), দক্ষিণ এশিয়া মানব উন্নয়ন, অনুবাদ ঃ বায়েস আব্দুল, ইউপিএল।

বাংলাদেশের বর্তমান জনসংখ্যা প্রায় ১৩ কোটি এবং খাদ্য চাহিদা ২ কোটি ৩৫ লক্ষ টন (১৯৯৮-৯৯ বছরে উৎপাদিত হয়েছে ২ কোটি ১৩ লক্ষ টন)। গত তিন দশকে ক্রমবর্ধমান জনসংখ্যার চাপে বাড়ীঘর ও ভৌত অবকাঠামো নির্মাণের জন্য প্রতি বছর গড়ে প্রায় ২ লক্ষ একর আবাদী জমি হ্রাস পাচ্ছে। পঞ্চম-পঞ্চবার্ষিকী পরিকল্পনায় ধার্যকৃত লক্ষ্যমাত্রানুসারে ২০০২ সাল নাগাদ ২.৫০ কোটি টন খাদ্য উৎপাদনের আশু চ্যালেঞ্জ আমাদের সামনে রয়েছে। আমাদের জনসংখ্যা বৃদ্ধির হার ১.৬% থেকে যদি ২০১০ সাল নাগাদ ১.৩৬% এবং ২০২০ সাল নাগাদ ১.১৬% এ কমিয়ে আনা সম্ভব হয়, তবুও ২০১০ সালে জনসংখ্যা হবে ১৫ কোটি ৩৬ লক্ষ এবং ২০২০ সালে তা বেড়ে দাঁড়াবে ১৭ কোটি ৩০ লক্ষে এবং খাদ্যের প্রয়োজন হবে যথাক্রমে ৩ কোটি টন ও ৩ কোটি ৩৪ লক্ষ টন। ক্রমহ্রাসকৃত জমি থেকেই আমাদের এই বাড়তি খাদ্য ফলাতে হবে। দেশের তরুণ/যুব শক্তিকে কাজে লাগানোর সুচিন্তিত পরিকল্পনার বাস্তবায়নের মাধ্যমে প্রয়োজনীয় খাদ্য উৎপাদনের এ চ্যালেঞ্জ মোকাবিলা করা যেতে পারে।

আমাদের দেশের মৎস্য ও পশু সম্পদ এ দু'টি খাতে উন্নয়নের সম্ভাবনা অনেক বেশী। প্রয়োজনীয় পুষ্টি চাহিদার ক্ষেত্রে প্রাণীজ আমিষের দৈনন্দিন যোগানের মাত্রা অনেক নীচে রয়েছে। তাই এ দুই খাতের উন্নয়ন ও চাহিদার পরিধিকে বিস্তৃত করতে যুব সমাজের ভূমিকা অনস্বীকার্য।

মৎস্য

১৯৯৬-৯৭ সালে অভ্যন্তরীণ আহরণ, মৎস্য চাষ ও সামুদ্রিক উৎস থেকে মোট ১.৪ মিলিয়ন টন মাছের উৎপাদন হয়। দেশের জনসংখ্যার চাহিদা মেটাতে আগামী ২০১০ সালে ৩ মিলিয়ন টন মাছ উৎপাদনের প্রয়োজন হবে। যুব সম্প্রদায়কে কাজে লাগিয়ে মুক্ত জলাশয়, বদ্ধ জলাশয় ও সামুদ্রিক উৎস থেকে বৈজ্ঞানিক পদ্ধতিতে মৎস্য চাষাবাদের পাশাপাশি প্রক্রিয়াজাতকরণের মাধ্যমে চাহিদার অতিরিক্ত মাছের রপ্তানী বৃদ্ধি করা যেতে পারে।

পশু সম্পদ

১৯৯৬-৯৭ সালে ১.৬ মিলিয়ন টন দুধ, ০.৫৭ মিলিয়ন টন মাংস ও ২২৯ কোটি ডিম উৎপাদিত হয়েছে। ক্রমবর্দ্ধমান জনসংখ্যার সুষম পুষ্টিকর খাবার নিশ্চিত করতে ২০১০ সাল নাগাদ দেশে ৩.৯ মিলিয়ন টন দুধ, ১.৪ মিলিয়ন টন মাংস ও ৭৩৭ কোটি ডিম উৎপদনের প্রয়োজন পড়বে। দুধ, মাংস ও ডিমের বর্ধিত চাহিদা মেটানোর জন্য পারিবারিক খামার ও বাণিজ্যিক খামার উভয় পর্যায়েই লাগসই প্রযুক্তি ব্যবহার করে শংকর জাতের গবাদি পশু ও হাইব্রীড জাতের হাঁস-মুরগী পালনের ক্ষেত্রে দেশের যুব শক্তিকে কাজে লাগানোর বিকল্প নেই। এতে করে কর্মসংস্থান বৃদ্ধি ও আয়ের বিরাট সুযোগ সৃষ্টি করবে। যা অন্য কোন শিল্পের মাধ্যমে করা দূরহ ব্যাপার। আশার কথা, এ লক্ষ্যকে সামনে রেখে যুব উন্নয়ন অধিদপ্তর প্রতিবছর গড়ে ৯৭,৩৮০ জন বেকার যুবক/যুব মহিলাকে বিভিন্ন ধরনের দক্ষতা উন্নয়নমূলক প্রশিক্ষণ প্রদানের ব্যবস্থা করেছে। আগামীতে প্রশিক্ষণার্থীর সংখ্যা আরও বৃদ্ধি করার পরিকল্পনাও তাদের রয়েছে বলে জানা গেছে।

আত্মবিশ্বাসে তারুণ্য ঃ

তরুণ/যুব সমাজ উন্নয়নের চালিকা শক্তি। বাংলাদেশ তথা বিশ্ব বিপুল যুব শক্তি ও ঐশ্বর্যের অধিকারী। মানুষের জন্য যে বয়সটি উত্থানের সেটি হলো যৌবনকাল। যৌবনের দৃষ্টি সুন্দর। এখানে সব কিছুই পাবার, হারাবার নয়। এ সময়ে সৌন্দর্য্য আসে দেহে, মনে এবং তার কর্মে। এ যৌবনকালে যেমন তার আশার শেষ নেই তেমনি পাবারও শেষ নেই। চাই সবই যা কিছু সুন্দর এ ভবে। নতুন করে গড়ে তুলতে চায় আবাস, পরিবেশ, দেশ তথা এ বিশ্বকে; এ যেন তারুণ্যের অন্তর্নিহিত এক বিরাট প্রত্যাশা। প্রতিশ্রুতি রয়েছে তার মনে। সৃষ্টির আনন্দে উল্লাসে রচনা করতে চায় অনাগত ভবিষ্যত; ইতিহাসে ভাষা আন্দোলন, স্বাধীনতা যুদ্ধ, খেলার মাঠে, বন্যা, খরা ইত্যাদি দূর্যোগ মোকাবিলায় তারুণ্যের পদচারণা চিরস্মরণীয় অধ্যায় রচনা করেছে নিঃসন্দেহে। তাই কবি কণ্ঠে উচ্চারিত হয় - "এ যৌবন জলতরঙ্গ রুধিবে কি দিয়া"।

উপসংহার ঃ

আমাদের দারিদ্র্য - হাজার বছরের বঞ্চনা, নিষ্পেষণের ফল, সহজেই তা নিরসন সম্ভব নয়, বরং বর্তমানে কেবল তার উপশমের ব্যবস্থা নেয়াই যুক্তি সংগত। এক্ষেত্রে অভ্যন্তরীণ ও বহিঃসম্পদের সর্বোচ্চ ব্যবহারের মাধ্যমে আমাদের প্রচেষ্টা অব্যাহত থাকার আবশ্যকতা রয়েছে। কিন্তু আমাদের সবচেয়ে বড় প্রতিবন্ধকতা হচ্ছে আর্থ-সামাজিক উন্নয়নের গতিশীলতা বজায় রাখা। তবে, একাজ সহজে সম্ভব হচ্ছে না দুর্নীতি, সন্ত্রাস ও মানবিকতার লংঘনের কারণে। এগুলিকে অতিক্রম করার জন্য দৃঢ় প্রতিজ্ঞা ও তার বাস্তবায়ন যত দ্রুত সম্ভব হবে ততই দ্রুত এ জাতির উন্নয়ন ঘটবে। বলার অপেক্ষা রাখে না যে, এ উন্নয়নের সর্বৈব অংশ তরুণ সমাজকে ঘিরেই আবর্তিত।

সহায়ক গ্রন্থাবলী ঃ

আলম, জাহাঙ্গীর (১৯৮৮), *বাংলাদেশে কৃষি ঃ খাদ্য সমস্যা ও সমাধান,* বাংলা একাডেমী, ঢাকা।

মাহমুদ, আনু (১৯৯৮), *দারিদ্র্য বিমোচন ও উন্নয়ন,* হাক্কানী পাবলিশার্স, ঢাকা।

--------- (১৯৯৭), *জাতীয় যুব উৎসব স্মরণিকা,* যুব উন্নয়ন অধিদপ্তর, যুব ও ক্রীড়া মন্ত্রণালয়।

হক, মাহবুব উল (১৯৯৭), *দক্ষিণ এশিয়া মানব উন্নয়ন,* ইউপিএল, ঢাকা।

--------- (১৯৯৯), *স্মরণিকা,* বাংলাদেশ কৃষিবিদ ইনষ্টিটিউশন, ঢাকা।

Bangladedh Bank (1996-97), *Annual Report*, Bangladedh Bank, Dhaka.

World Bank (1997), *World Development Report*, New York, Oxford University Press.

World Bank (1998/99), *World Development Report*, New York, Oxford University Press.

Major points for contributors:

1. The Academy welcomes original articles based on the field experience/data in the field of rural development.
2. The views expressed in the published articles are those of the authors and the Rural Development Academy will not accept any responsibility in this regard.
3. The copyright in all the articles published in the journal is vested in the Rural Development Academy, Bogra. The authors of the published articles will not be allowed to publish the same elsewhere without prior permission of the Academy.
4. The Journal will not usually publish articles in excess of 8000 words.
5. The article should be preceded by a summary which should be a maximum length of 200 words.
6. The published articles may be used as reference materials in other original writings with due acknowledgement and no permission is required in this regard.
7. Each contributor to the journal will be provided with two copies of the concerned issue free of charge.
8. The articles can be either in Bangla or in English. However, mixture of both Bangla and English in the same paper will not normally be acceptable except on special grounds.
9. Four copies of manuscripts typed clearly and double spaced with margin in four sides of the paper should be submitted for consideration of Editorial Board. Diagrams and figures should be used when absolutely necessary and done on black ink.
10. Manuscripts should be submitted to:
    The Executive Editor
    Bangladesh Rural Development Studies
    Rural Development Academy, Bogra
    Bogra-5842, Bangladesh.