

Changes in Livelihood Status of Farmers Due to *Meghna-Dhonagoda* Irrigation Project Activities

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Abstract

The main focus of the paper was to determine the change in livelihood status of the beneficiaries after implementation of *Meghna-Dhonagoda* Irrigation Project (MDIP). The study was conducted in MDIP area of Matlab North Upazila under Chandpur district. Out of 308, one hundred and eight beneficiaries were randomly selected which constituted the sample. Data were collected during 10 February to 20 March 2004 using interview schedule. Overall changes in livelihood status has been evaluated into four dimension namely, changes in occupational pattern; changes in communication pattern; changes in time utilization; and change in daily working schedule of the respondents. The main occupation as crop cultivation, fishing, poultry rearing, milking cow rearing, ferrying by boat etc. have been changed due to intervention of the irrigation project. Similarly, farmers' other occupation also changed to substantial extent. The number of main occupation and other occupations also increased after implementation of the project. The findings reveal that the communication facilities in case of bicycle, rickshaw, rickshaw van, motorcycle, baby taxi, microbus and ferry increased by 19.45, 62.04, 17.59, 11.11, 43.52, 2.78 and 32.4 percents, respectively, while the habit of walking by foot and boat decreased by 51.85 and 100 percent, respectively. The busyness in all the year round and nine months in a year increased by 46.29 and 9.26 percent, respectively. On the other hand busyness in 6 months in a year and 3 months in a year decreased by 43.52 and 12.04 percents respectively due to intervention of the MDIP. In case of change in time utilization, the findings reveal that the pattern of time utilization remarkably changed among men after implementation of MDIP. Daily working schedule of both male and female farmer also positively changed due to increase income generating activities. In all, the findings clearly demonstrated that the overall socio-economic conditions of the beneficiaries considerably improved due to the interventions of the MDIP in the area.

Keywords: Change, Livelihood status, Farmer and *Meghna-Dhonagoda* Irrigation Project

Introduction

The *Meghna-Dhonagoda* Irrigation Project (MDIP) is one of the largest irrigation projects assisted by Asian Development Bank in Bangladesh. The project aims to increase agricultural production, create

employment opportunities and improve the living conditions of the farmers through provision of flood control, embankments, pumping stations, irrigation and drainage facilities and agricultural development. The

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main components of the project are a 60 km flood embankment, two primary pumping stations, two booster pumping stations, 218 km of main and secondary irrigation canals and 125.5 km of drainage canals, road network, power transmission lines, a communication systems, etc. (Anonymous, 1985). The MDIP work was started in 1979-80 and ended in 1987-88 fiscal year where total project cost was US \$ 54.80 million. The project was executed to protect 17,584 ha area from flood and drainage congestion and to provide irrigation facility to 13,602 ha of land. Under pre-project condition 90% of the area was inundated by 0.60 to 3.00 m depth of flood water for a period of six months.

A livelihood is sustainable when it can cope with and recover from the stresses and

shocks and maintain or enhance its capabilities and assets both now and in the future without undermining the natural resource base (Chambers and Conway, 1988). "Livelihoods" are the ways people combine their capabilities, skills and knowledge with the resources at their disposal to create activities that will enable them to make a living. Livelihood status is the state of individuals which indicates his/her socio-economic conditions, living environment or their standard of living (DFID, 1999). However, no significant research studies have been reported to determine the effect of MDIP in the changes of livelihood status among farmers. Hence a study was conducted to assess and evaluate change in livelihood status of farmers due to the intervention of MDIP.

Methodology

The main focus of this study was to determine the change in livelihood status of the beneficiaries after implementation of MDIP. Data for this study were collected from a sample rather than the whole population. In this connection, multistage random sampling method was followed in order to select the sample. Six out of 14 unions were randomly selected for this study. The population was head of the households of either male or female. A list of 308 beneficiaries was collected from Bangladesh Water Development Board, Chandpur office, constituted the population for the study. Out of the population, 108 beneficiaries (about 35 percent) were selected, where 92 were male and only 16 were female farmer, as the sample by using a Table of Random Numbers (Kerlinger, 1973). Data were personally collected with the help of pre-tested interview schedule during the period

from 10 February to 20 March 2004. Simple direct questions and scales were included in the interview schedule. Changes in livelihood status was divided into four sub-variables, namely, change in occupational pattern; change in communication pattern; change in time utilization in year round work; and change in daily working schedule of the respondents. The beneficiaries were asked to provide information about their main occupation as well as other occupation(s). Changes in occupational pattern were measured by computing frequency between "before" and "after" situation. Changes in communication pattern were measured by asking the beneficiaries to give their opinion regarding the name of the transport they have used before and after MDIP implementations. In this regard, nine items were included which were walking by foot, boat, bicycle, rickshaw, van, motorcycle,

baby taxi, microbus, and ferry. This was measured by asking the beneficiaries about change in communication pattern due to intervention of MDIP. An effort has been made to ascertain what extent the time utilization of the beneficiaries has been increased due to intervention of the irrigation project. In this regard, a year has been divided into four dimensions which are 3 months in a year, 6 months in a year, 9 months in a year and finally all the year round. For the measurement of change in daily working schedule of the respondents, sub-variable divided into two aspects which

were working schedule of male and female farmer. The whole working hour were divided into seven groups such as 05.30 AM to 07.00 AM; 07.01 AM to 09.00 AM; 09.01 AM to 01.00 PM; 01.01 PM to 02.00 PM; 02.01 PM to 04.00 PM; 04.01 PM to 08.00 PM; and 08.01 PM to 10.00 PM. Each beneficiary was asked to opine his/her working schedule in an average day with name of the work and accordingly noted in the interview schedule. Apart from these, various statistical measures like number, range, percent and mean were used to describe the data.

Findings and Discussion

Change in livelihood status

Livelihood status can be conceptualized in a variety of forms. However, no measure is complete and each has its own limitation and merits. Change in occupational pattern, change in communication pattern and change in time utilization in year round work and change in working schedule of farmer were included under change in livelihood status.

Change in occupational pattern of beneficiaries of MDIP

The findings presented at Table 1 clearly indicated that MDIP had direct impact in improving the occupational pattern of beneficiaries of MDIP.

Table 1. Change in occupational pattern of beneficiaries in MDIP

| Occupation before implementation of the irrigation project | | | | Occupation after implementation of the irrigation project | | | |
|--|-------|--|-------|---|-------|---|-------|
| Main occupation | Freq. | Other Occupation | Freq. | Main Occupation | Freq. | Other Occupation | Freq. |
| 1. Crop Cultivation | 75 | 1. Small scale poultry rearing | 57 | 1. Crop Cultivation | 71 | 1. Small scale aquaculture | 52 |
| | | 2. Small scale goat rearing | 18 | 2. Share Cropping | 8 | 2. Small scale poultry rearing | 67 |
| 2. Fishing | 18 | 3. Small scale milking cow rearing | 32 | 3. Pisciculture | 10 | 3. Small scale milking cow rearing | 42 |
| 3. Poultry rearing | 5 | 4. Small scale cattle rearing | 38 | 4. Poultry rearing | 6 | 4. Small scale business | 19 |
| 4. Fostering milking cow | 17 | 5. Small scale homestead vegetable gardening | 26 | 5. Milking cow rearing | 13 | 5. Small scale nursery | 7 |
| 5. Ferrying by boat | 8 | 6. Share cropping | 4 | 6. Business | 18 | 6. Selling labour | 9 |
| 6. Rickshaw pulling | 5 | 7. Small scale pisciculture | 19 | 7. Service | 14 | 7. Part time Rickshaw pulling | 8 |
| 7. Day labourer | 10 | 8. Small scale nursery | 4 | 8. Selling labour | 6 | 8. Tea stall keeping | 12 |
| 8. Business | 6 | 9. Sweing katha | 7 | 9. Fish selling | 4 | 9. Katha sewing | 7 |
| 9. Service | 3 | 10. Bamboo Works (Making fish trap) | 37 | 10. Rickshaw pulling | 5 | 10. Dress sewing | 8 |
| | | | | 11. Van pulling | 3 | 11. Embroidery works | 5 |
| | | | | 12. Baby Taxi driving | 3 | 12. Winter dress making | 4 |
| | | | | 13. Money Laundering | 2 | 13. Pottery | 3 |
| | | | | 14. Crop whole selling & buying | 6 | 14. Acting as middle man | 5 |
| | | | | 15. Hat, bazaar, Gat bidding | 2 | 15. Match making, seasonal business and small scale farming | 48 |

The main occupation as crop cultivation, fishing, poultry rearing, milking cow rearing, ferrying by boat etc. have been changed due to intervention of the irrigation project. Similarly, other occupation of the farmers also changed to substantial extent. The

number of main occupation and other occupations also increased after implementation of the project.

Change in communication pattern

The findings are presented in Table 2.

Table 2. Distribution of change in communication pattern before and after implementation of the MDIP

| Sl. No. | Name of the transport | Before implementation of the project (Frequency) | After implementation of the project (Frequency) | Change in % of the value |
|---------|-----------------------|--|---|--------------------------|
| 1. | Walking by foot | 108 (100)* | 52 (48.15) | -51.85 |
| 2. | By Boat | 108 (100) | 0 (0.0) | -100 |
| 3. | By Bicycle | 14 (12.96) | 35 (32.41) | 19.45 |
| 4. | By rickshaw | 25 (23.15) | 92 (85.19) | 62.04 |
| 5. | By rickshaw Van | 12 (11.11) | 31 (28.7) | 17.59 |
| 6. | By Motorcycle | 3 (2.78) | 15 (13.89) | 11.11 |
| 7. | By Baby Taxi | 0 (0.0) | 47 (43.52) | 43.52 |
| 8. | By Microbus | 0 (0.0) | 3 (2.78) | 2.78 |
| 9. | By Ferry | 0 (0.0) | 35 (32.41) | 32.41 |

* Figures within parenthesis indicate the percentages of items of changes

It is clearly demonstrated that MDIP had direct impact in improving communication pattern of the beneficiaries of Matlab north upazila under Chandpur district (Table 2). The communication facilities in case of bicycle, rickshaw, rickshaw van, motorcycle, baby taxi, microbus and ferry have been increased by 19.45, 62.04, 17.59, 11.11, 43.52, 2.78 and 32.4 percents respectively while the habit of walking by foot and boat have decreased by 51.85 and 100 percent respectively.

This indicated that the road infrastructures have been developed due to control of flood and irrigation system by the embankment. The communication pattern by boat totally decreased because of no water stagnation during rainy season. The bicycle, rickshaw, motorcycle, baby taxi etc. are plying across the study area due to implementation of the project. People in this area are able to avail of

the communication facilities because their annual income have been increased due to increased farm production through intervention of the project.

Change in time utilization in year round work

The findings at Table 3 clearly demonstrated that MDIP had direct impact in increasing the time utilization in year round work of the beneficiaries of Matlab north Upazila under Chandpur district. The busyness in all the year round and 9 months in a year have been increased by 46.29 and 9.26 percent respectively. On the other hand busyness in 6 months in a year and 3 month in a year have been decreased by 43.52 and 12.04 percent respectively (Table 3). This implied that the beneficiaries of the study area were busy in all the year round.

Table 3. Distribution of change in time utilization in year round work

| Sl. No. | Time spent in generating activities | Before implementation of the project (frequency) | After implementation of the project (frequency) | Change in % of the value |
|---------|-------------------------------------|--|---|--------------------------|
| 1. | 3 months in a year | 15 (13.89)* | 2 (1.85) | -12.04 |
| 2. | 6 months in a year | 57 (52.78) | 10 (9.26) | -43.52 |
| 3. | 9 month in a year | 24 (22.22) | 34 (31.48) | 9.26 |
| 4. | All the year round | 12 (11.11) | 62 (57.4) | 46.29 |

* Figures within parentheses indicate the percentages of items of changes

Change in daily working schedule of the farmer

Data found from this variable has two aspects which were daily working schedule of the male farmer and female farmer that are describe chronologically:

Change in daily working schedule of the male farmer

The findings at Table 4 clearly demonstrated that MDIP had direct impact in improving

the daily working schedule of the male respondents. The daily working schedule was divided into seven dimensions and it is clearly depicted that the male beneficiaries' busyness have been increased from 'before' to after' situation due to intervention of the MDIP. The findings reveal that the pattern of time utilization remarkably changed among men after implementation of MDIP.

Table 4. A summary statement showing change in daily working schedule of male farmer in the study area before and after implementation of the project (N=92)

| Sl. No. | Time | Before implementation of the project | Freq. | After implementation of the Project | Freq. |
|---------|--------------------|--|-------|--|--|
| 1. | 5.30 AM to 7.00 AM | 1) Continuous sleeping | 7 | 1) Continuous sleeping | 2 |
| | | 2)Waking up | 85 | 2)Waking up | 90 |
| | | 3) Getting down the poultry & cattle from their shed | 63 | 3) Getting down the poultry & cattle from their shed | 82 |
| | | 4) Feeding the cow & poultry | 63 | 4) Feeding the cow & poultry | 82 |
| | | 5) Washing hand & mouth | 74 | 5) Washing hand & mouth | 88 |
| | | 6) Praying | 71 | 6) Praying | 66 |
| | | 7) Taking breakfast | 92 | 7) Taking breakfast | 92 |
| | | 8) Milking the cow & go to the market for selling | 65 | 8) Milking the cow & go to the market for selling | 70 |
| | | 9) Going to the field | 81 | 9) Going to the field | 87 |
| | | 10) Going to catching fish | 21 | 10) Going to catching fish | 03 |
| | | | | | 11) Taking care of homestead gardening |
| 2. | 7.01 AM to 9.00 AM | 1)Taking care of cattle | 85 | 1)Taking care of cattle | 72 |
| | | 2) Homestead vegetable gardening | 46 | 2) Homestead vegetable gardening | 65 |
| | | 3) Marketing | 31 | 3) Marketing | 73 |
| | | 4) Running the shops | 14 | 4) Running the shops | 46 |
| | | 5) Threshing the crops | 53 | 5) Threshing the crops | 77 |
| | | 6) Ploughing the field | 71 | 6) Ploughing the field | 88 |
| | | 7) Work in field | 72 | 7) Work in field | 89 |
| | | | | 8) Manage the labour to work in the field | 67 |
| | | | | 9) Collecting seedling & cleaning | 52 |
| | | | | 10) Management of the irrigation water | 77 |

| | | | | | |
|----|---------------------|--|----|--|----|
| 3. | 9.01 AM to 1.00 PM | 1) Going to work in own field | 75 | 1) Going to work in own field | 86 |
| | | 2) Selling the labour | 41 | 2) Selling the labour | 21 |
| | | 3) Going to job place to run the job | 11 | 3) Going to job place to run the job | 20 |
| | | 4) Sun drying the fish | 18 | 4) Sun drying the fish | 2 |
| | | | | 5) Running the business | 46 |
| | | | | 6) Management of the irrigation water | 77 |
| 4. | 1.01 PM to 2.00 PM | 1) Washing the cattle | 82 | 1) Washing the cattle | 67 |
| | | 2) Taking bath | 81 | 2) Taking bath | 72 |
| | | 3) Praying | 65 | 3) Praying | 55 |
| | | 4) Taking lunch | 68 | 4) Taking lunch | 61 |
| | | 5) Sun drying the fish | 18 | 5) Sun drying the fish | 2 |
| 5. | 2.01 PM to 4.00 PM | 1) Go back to work | 81 | 1) Go back to work | 78 |
| | | 2) Marketing the crops | 52 | 2) Marketing the crops | 73 |
| | | 3) Taking bath | 9 | 3) Taking bath | 17 |
| | | 4) Praying | 15 | 4) Praying | 13 |
| | | 5) Having lunch | 27 | 5) Having lunch | 31 |
| | | 6) Taking rest | 31 | 6) Taking rest | 14 |
| | | 7) Running the shop | 5 | 7) Running the shop | 33 |
| | | 8) Sun drying the fish | 12 | 8) Sun drying the fish | 1 |
| | | 9) Collecting the cattle feed | 42 | 9) Collecting the cattle feed | 34 |
| | | 10) Doing the work as a day laborer | 23 | 10) Doing the work as a day laborer | 8 |
| | | | | 11) Buying the agril. Inputs | 56 |
| 6. | 4.01 PM to 8.00 PM | 1) Going back to work | 58 | 1) Going back to work | 73 |
| | | 2) Taking care of cattle & poultry | 81 | 2) Taking care of cattle & poultry | 67 |
| | | 3) Bearing the harvested crops | 47 | 3) Bearing the harvested crops | 82 |
| | | 4) Selling products or buying household things | 85 | 4) Selling products or buying household things | 89 |
| | | 5) Gathering in tea stalls | 36 | 5) Gathering in tea stalls | 15 |
| | | 6) Participation in community meetings | 18 | 6) Participation in community meetings | 58 |
| 7. | 8.01 PM to 10.00 PM | 1) Coming back to home | 86 | 1) Coming back to home | 89 |
| | | 2) Taking cattle to the cow shed | 72 | 2) Taking cattle to the cow shed | 78 |
| | | 3) Washing hand & face | 81 | 3) Washing hand & face | 76 |
| | | 4) Having food | 92 | 4) Having food | 92 |
| | | 5) Taking care of the children during study | 19 | 5) Taking care of the children during study | 63 |
| | | 6) Watching TV & listening Radio | 4 | 6) Watching TV & listening Radio | 48 |
| | | 7) Talking to neighbors | 39 | 7) Talking to neighbors | 33 |
| | | 8) Talking to wife and children | 48 | 8) Talking to wife and children | 67 |
| | | 9) Going to bed with | 87 | 9) Going to bed with | 85 |

Change in daily working schedule of the women farmer

The findings at Table 5 clearly demonstrated that MDIP had direct impact in improving the daily working schedule of the female respondents. The daily working schedule was divided into seven dimension and it is clearly depicted in Table 5 that the women

beneficiaries' busyness have been increased considerably from 'before' to 'after' due to intervention of the MDIP. The findings demonstrated that like men and women's time utilization changed noticeably after implementation of MDIP. The women got more scope of time utilization in income generation activities after MDIP intervention.

Table 5. A summary statement showing change in daily working schedule of female farmer in the study area before and after implementation of the project (N=16)

| Sl. No. | Time | Before implementation of the project | Freq. | After implementation of the Project | Freq. |
|---------|--------------------|--|-------|--|-------|
| 1. | 5.30 AM to 7.00 AM | 1) Waking up | 13 | 1) Waking up | 14 |
| | | 2) Washing hand & mouth, completing prayer | 13 | 2) Washing hand & mouth, completing prayer | 14 |
| | | 3) Clearing up cattle & poultry house and feeding them | 12 | 3) Clearing up cattle & poultry house and feeding them | 7 |
| | | 4) Sweeping house & homestead | 14 | 4) Sweeping house & homestead | 8 |
| | | 5) Washing up utensils | 15 | 5) Washing up utensils | 14 |
| | | 6) Boiling rice | 7 | 6) Boiling rice | 13 |
| | | 7) Threshing crops | 5 | 7) Threshing crops | 10 |
| 2. | 7.01 AM to 9.00 AM | 1) Preparing breakfast | 15 | 1) Preparing breakfast | 16 |
| | | 2) Serving food to family | 15 | 2) Serving food to family | 16 |
| | | 3) Taking own breakfast | 14 | 3) Taking own breakfast | 16 |
| | | 4) Taking cattle to field | 5 | 4) Taking cattle to field | 2 |
| | | 5) Bathing the children & sending them school | 6 | 5) Bathing the children & sending them school | 12 |
| | | 6) Spreading the crops for sun drying | 16 | 6) Spreading the crops for sun drying | 16 |
| | | 7) Taking care of the homestead vegetables | | 7) Taking care of the homestead vegetables | 7 |
| 3. | 9.01 AM to 1.00 PM | 1) Cleaning utensils | 15 | 1) Cleaning utensils | 13 |
| | | 2) Collecting fuel | 14 | 2) Collecting fuel | 7 |
| | | 3) Collecting vegetables | 11 | 3) Collecting vegetables | 3 |
| | | 4) Fetching water | 14 | 4) Fetching water | 4 |
| | | 5) Mopping house | 12 | 5) Mopping house | 8 |
| | | 6) Drying rice or other agricultural products | 16 | 6) Drying rice or other agricultural products | 16 |
| | | 7) Cooking | 12 | 7) Cooking | 16 |
| | | 8) Taking care of the cattle & poultry time to time | 13 | 8) Taking care of the cattle & poultry time to time | 10 |
| 4. | 1.01 PM to 2.00 PM | 1) Boiling | 14 | 1) Boiling | 15 |
| | | 2) Cleaning up children | 12 | 2) Cleaning up children | 13 |
| | | 3) Washing up cloths of all family member | 13 | 3) Washing up cloths of all family member | 10 |
| | | 4) Saying Johr prayer | 13 | 4) Saying Johr prayer | 14 |
| | | 5) Serving food | 10 | 5) Serving food | 12 |
| | | 6) Having own food | 14 | 6) Having own food | 13 |
| | | 7) Cleaning up utensil | 5 | 7) Cleaning up utensil | 4 |
| 5. | 2.01 PM to 4.00 PM | 1) Taking rest | 7 | 1) Taking rest | 3 |
| | | 2) Winnowing/cleaning & storage the sun dried crops | 8 | 2) Winnowing/cleaning & storage the sun dried crops | 13 |
| | | 3) Preparing the crops for marketing | 8 | 3) Preparing the crops for marketing | 12 |
| 6. | 4.01PM to 8.00 PM | 1) Sweeping premises of the houses | 14 | 1) Sweeping premises of the houses | 13 |
| | | 2) Taking care & feeding poultry & cattle | 15 | 2) Taking care & feeding poultry & cattle | 15 |
| | | 3) Fetching cooking water & vegetable | 12 | 3) Fetching cooking water, vegetable | 11 |
| | | 4) Cleaning the children | 7 | 4) Cleaning the children | 12 |
| | | 5) Preparation for cooking | 14 | 5) Preparation for cooking | 13 |
| | | 6) Cooking | 14 | 6) Cooking | 13 |

| | | | | | |
|----|---------------------|---|----|---|----|
| 7. | 8.01 PM to 10.00 PM | 1) Feeding children | 8 | 1) Feeding children | 12 |
| | | 2) Serving husband and other members of the family | 15 | 2) Serving husband and other members of the family | 16 |
| | | 3) Having own food | 16 | 3) Having own food | 16 |
| | | 4) Taking care of the children during study | 5 | 4) Taking care of the children during study | 10 |
| | | 5) Watching TV | 1 | 5) Watching TV | 9 |
| | | 6) Small discussion with Husband or other family member | 12 | 6) Small discussion with Husband or other family member | 15 |
| | | 7) Praying | 13 | 7) Praying | 14 |
| | | 8) Making bed | 16 | 8) Making bed | 15 |
| | | 9) Going to sleep | 16 | 9) Going to sleep | 15 |

Conclusion

The MDIP had direct impact in improving the occupational and communication patterns of beneficiaries due to intervention of the project. Also, daily working schedule of the male and women farmer has been changed. It is clearly demonstrated that MDIP had direct impact in improving communication pattern of the beneficiaries of Matlab north upazila under Chandpur district. People in this area are able to avail of the transport facilities because their higher annual income due to increased farm production through intervention of the project. The farmers' business in year round work increased due to intensive crop cultivation. Thus it may be concluded that as a result of the introduction of MDIP the beneficiaries got ample scope to utilize their time in year round work.

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