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## Farmer's Feeling of Need and Actual Practice of Water Management for Jute Production in Bangladesh

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**Abstract:** An investigation was made at farmers level of Kishoregonj and Manikganj, the two important jute growing areas of Bangladesh in order to enumerate the water management status in jute production in terms of farmers actual practices and their feeling of need about the same. Results revealed that average 64% farmers at Kishoregonj and 69% at Manikganj felt the necessity of irrigation, whereas 13 and 40% farmers at Kishoregonj and Manikganj actually practiced the same respectively. Similarly, 79 and 70% of farmers at Kishoregonj and Manikganj respectively felt the necessity of draining out the excess water from their jute field but 70 and 52% farmers actually practiced the same respectively. The difference between farmers feeling and actual practice on irrigation was wide while the difference between farmers feeling and actual practice on draining out the excess water was narrow which clearly showed the importance of drainage over irrigation in jute production at farmers level. But the statistical significant difference between feeling need and actual practice for improved water management are yet to prevalent over what farmers got from their forefathers.

**Key words:** Water management, jute Bangladesh, Irrigation

### Introduction

Water management in jute production includes application of irrigation water in need and drains out of excess/stagnant water from jute fields. Irrigation is the artificial application of water to the crop for its growth (Rahman *et al.*, 1992). Benefits derived from proper irrigation include; (i) increased yield, (ii) improved crop quality, (iii) controlled time of planting and harvesting so as to obtain a more favorable market price as well as maximum utilization of land with a planned multi-cropping pattern, (iv) reduced damage by control of high air temperature, (v) increased efficiency of fertilizers and reduced cost of application and (vi) a stabilized farm income (Rahman *et al.*, 1992).

On the other hand the excess/stagnant water whatever the source is need to be removed from the field for normal plant growth. Removal of such excessive water from the field is known as drainage (Rahman and Azad, 1991). In the presence of excess water and in absence of drainage facility in the jute fields the following problem arises; (i) reduce growth of jute plants, (ii) causes incidence of diseases and pests, (iii) increased toxicity of undesirable elements, (iv) increase alkalinity and salinity of the soil, (v) roots system can not develop well and (vi) reduces growth of beneficial microorganisms (Rahman and Azad, 1991).

Jute grows in kharif season (first week of April to last week of October) in Bangladesh when average precipitation is high. Being cultivated in kharif season, there has been little application of irrigation water (Rahman *et al.*, 1992). But rainfall may always not be sufficient for crop requirement and also there is no guarantee of timely rainfall. Due to irrigation an increase of 20.80% fibre yield was obtained over no irrigation (Chi *et al.*, 1969). Majlis *et al.* (1983-84) made an intensive investigation on jute based two and three cropping patterns under rainfed and irrigated condition respectively for around 20 years (1964-1985) and concluded that gross margin as well as employment generation clearly increased in three cropping patterns under irrigated condition (Majlis *et al.*, 1983-84). The advantages of irrigation for a targeted date ensure timely seeding of jute and guarantee for a three cropping pattern

(Hussain, 1985).

Desi jute (*C. capsularis* L.) is generally grown in the medium high and medium low land and can withstand waterlogging/excess water for a certain period but, Tossa jute (*C. olitorius* L.) is grown in medium high and high land and can not withstand waterlogging/excess water (Rahman and Azad, 1991). Growth of both the species of jute is generally affected more or less due to waterlogging condition at early stage of crop growth. Therefore, yield of fibre is reduced unless excess water is removed from jute field by appropriate drainage system (Rahman and Azad, 1991). Sometimes excessive and continuous rain hamper jute-sowing process. Again, most of the jute fields are of uneven surface and have no drainage facility (Rahman and Azad, 1991). Hence, rain water stands for a long time in the jute field. This excess water causes late sowing or death of young seedlings and reduces the fibre production (Rahman and Azad, 1991).

Thus both irrigation in need and draining out of excess/stagnant water have more or less importance in jute production. Jute growers are habituated to follow the technology/practice, which has been developed through their experiences and hereditary from their forefathers and they do not like to readily change their practices (Azad, 1984). Farmers will pay due attention to the research findings about which they have some experience and seem to be more important to them which directed to take the present study.

### Materials and Methods

The present study was conducted in the year 1994-95. Three villages namely- Ayla, Babudia and Vaskarkhilla at Kishoregonj and three villages namely- Kalampur, Bhalum and Bathuli at Manikganj were selected as sample area for the present study.

Sample farmers were selected from the base-line respondents. Stratified random sampling method was adopted for selection of the sample farmers. Criteria for stratification was farm size (marginal; 0.0 to 0.20 ha, small; 0.21 to 1.01 ha, medium; 1.02 to 2.02 ha and large; above 2.02 ha). Altogether 100 farms were interviewed, taking 50 farms from Kishoregonj and 50 farms from Manikganj. Number of sample farms selected from different farm size group were at Kishoregonj: marginal; 12, small; 15, medium; 13 and large; 10 and at Manikganj: marginal; 13, small; 16, medium; 12 and large; 9. Data were collected through a questionnaire survey developed for the purpose.

Descriptive and analytical techniques were adopted to analyze the data. Tables were constructed based on arithmetic mean, percent and regression analysis result.

### Results and Discussion

Farmers at Manikganj (all farm size) felt more importance of irrigation (average 70%) in jute production compared to the farmers at Kishoregonj (average 64%). Also in actual practice farmers at Manikganj somewhat advanced (average 36%) compared to the farmers at Kishoregonj (average 13%). But, on an average 67% farmers of these two regions felt the need of irrigation; whereas in actual practice, only 24% farmers (average) of these two regions followed irrigation in need (Table 1a). From the regression analysis result (Table 1b) below, percentage of farmers feeling for irrigation need and their actual practice of

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Table 1a: Farmers feeling and practice irrigation in jute field (%)

Farm size	Feel irrigation need			Practice irrigation		
	Kishoregonj	Manikgonj	Mean	Kishoregonj	Manikgonj	Mean
Marginal	58.82	26.32	42.57	15.69	21.05	18.37
Small	64.71	75.86	70.29	14.12	46.55	30.34
Medium	71.43	76.92	74.18	14.29	30.77	22.53
Large	61.29	100.00	80.72	6.45	45.45	25.95
Average	64.01	69.78	66.94	12.64	35.96	24.30

Source: Field survey in 1994-95

Table 1b: Regression analysis result of farmers feeling and practice irrigation (%) at Kishoregonj and Manikgonj area

Independent Variable	Coefficient
Intercept	43.03**
Between farmers feeling and practice	-42.6225**
Among the farm size	6.6525**
Between farmers of Kishoregonj and Manikgonj area	14.515**
R <sup>2</sup>	0.755642

Table 2a: Farmers feeling and actual practice of drainage (%)

Farm size	Feel drainage need			Practice drainage		
	K. ganj	M. ganj	Mean	K. ganj	M. ganj	Mean
Marginal	72.35	31.58	51.97	50.98	10.53	30.76
Small	80.00	87.93	83.97	81.18	56.89	69.04
Medium	100.00	30.77	65.39	89.29	76.92	83.11
Large	71.00	90.91	80.96	67.74	72.73	70.24
Average	80.84	60.30	70.57	72.30	54.27	63.29

Source: Field survey in 1994-95.

Table 2b: Regression analysis result of farmers feeling and practice drainage (%) at Kishoregonj and Manikgonj area

Independent variable	Coefficient
Intercept	55.0975**
Between farmers feeling and practice	-7.285**
Among the farm size	10.045**
Between farmers of Kishoregonj and Manikgonj area	-19.285**
R <sup>2</sup>	0.401643

\* For 95% and \*\* for 99% confidence level.

irrigation for jute field are significantly different. Similarly, statistically significant differences also prevalent among the farmers of Kishoregonj and Manikgonj area irrespective of farm sizes for feeling and actual practice of irrigation in jute field.

Farmers at Kishoregonj area felt more necessity (average of all farm size 81%) of draining out the excess water from their jute fields and at the same time they also practiced it more (average 72%) than that of farmers at Manikganj area. On the other hand, on an average 60% of farmers at Manikganj area felt draining out of excess water (of all farm size) and an average of 54% actually practiced the same. On an average, 71% farmers of these two areas felt drainage need and 63% of them actually practiced it in their jute fields (Table 2a). From the regression analysis result (Table 2b) below percentage of farmers feeling for drainage need and their actual practice of drainage for jute field are significantly different. Similarly, statistically significant differences also prevalent among the farmers of Kishoregonj and Manikgonj area irrespective of farm sizes for feeling and actual practice of drainage in jute field.

Irrigation need felt by the farmers of Kishoregonj and Manikganj areas was 67%, whereas their average actual practice was only 24%, which showed a wide difference (43%) between feeling and actual practice. The main reason behind it is that jute grows in kharif season (1st week of April to last week of October) in Bangladesh when average precipitation is high (Rahman *et al.*, 1992). The peak rate of water use by jute plant occurs from 40 to 60 days of its growth (Gupta *et al.*, 1970) i.e., May to June, when maximum precipitation is expected. Water requirement of early sown jute crop is about 45 mm during pre-monsoon period and available soil moisture of 50% give highest yield of fibre (Pandey *et al.*, 1969). Jute grows in Bangladesh usually sow seed in the residual moisture after pre-monsoon showers during March to May (Rahman and Azad, 1991). In both Kishoregonj and Manikganj

areas, price of jute fibre at the sowing time was higher than that of harvesting time, also price of jute fibre was not at all in satisfactory level in the local market (Majlis *et al.*, 1984-85). So, jute farmers of these two regions were not so much interested to construct costly irrigation facilities for jute field (Table 1a). Therefore irrigation in jute field has got little importance to the growers now.

On an average 71% farmers at Kishoregonj and Manikganj areas felt the need of drainage and 63% of them actually practiced the same in their jute field. Feeling and actual practice by the farmers in case of drainage were high as compared to irrigation (Table 2a). The difference between farmers feeling and actual practice on drainage of these two regions were minimum (only 8%), as they paid due importance to it. Tossa jute is grown in medium high and high land and can not withstand waterlogging/excess water. Therefore, yield of jute is reduced considerably unless excess water is removed by appropriate drainage system (Rahman and Azad, 1991). Fifty one percent farmers at Kishoregonj and 56% farmers at Manikganj area used improved jute seeds (tossa variety) and also use of improved seeds increased with the increase of farm size. "Draining out of excess water from jute field" as a component of improved package of technology for jute cultivation enumerated as high as 9.5 to 26% of extra yield (Rahman *et al.*, 1996, 2000). So, drainage in jute fields is getting more importance over irrigation at farmer's level day by day. But statistical analysis yet presupposes the significant difference between the feeling and actual practice of drainage (Table 2b).

Therefore, conclusively it can be said that drainage in jute field has got more importance over irrigation practice at farmer's level in jute production at Kishoregonj and Manikganj agro-ecological condition but farmer's actual practice yet to pace with their feeling as well as improved technological innovation. Appropriate research programs are to be undertaken for developing suitable drainage system for jute field.

### References

- Azad, A.K., 1984. Agricultural technology for jute production in Bangladesh. *Jute and Jute Fabrics Bangladesh*, 10: 11-15.
- Chi, C.Y., H.T. Chu and C.C. Tai, 1969. Study of the effect of irrigation and supplying additional amount of fertilizers in growing stage of jute, *Agri. Asso. China News Ser. No. 57, Res. Rept. Taiwan-FCFS New Ser. No. 33, March*.
- Gupta, S.R. and K.S. Dargan, 1970. Water requirement of white jute (*C. capsularis* L.) and Tossa jute (*C. olitorius* L.), *Indian J. Agric. Sci.*, 40: 505-511.
- Hussain, M., 1985. Irrigated jute, Presented Paper on "Low water use cropping pattern for irrigated agriculture" at BARC, Farm Gate, Dhaka, Bangladesh.
- Majlis, M.A.K., A.K. Azad, M.L. Rahman, M.N. Nabi, S.S. Chowdhury and F. Haque, 1983-84. Annual Report, Jute based cropping system research and development program, BJRI, Dhaka-1207, Bangladesh.
- Pandey, S.N., K.S. Dargan and Tripathi, 1969. Effect of irrigation and nitrogen on jute yield. *Fertilizer News*, 14: 40-42.
- Rahman, M.M. and A.K. Azad, 1991. Drainage in Jute Fields, *Jute and Jute Fabrics Bangladesh*, 17: 7-8.
- Rahman, M.L., M.M. Rahman, A.K. Azad, M. Nuruzzaman and A.B. Siddique, 1996. Relative Contribution of Component Technologies in Jute Production, *B. J. Jute Fib. Res.*, 21: 1-8.
- Rahman, M.M., A.K. Azad and M.L. Rahman, 1992. Irrigation in Jute production, *Jute and Jute Fabrics Bangladesh*, 18: 5-8.
- Rahman, M.M., M.L. Rahman, A.K. Azad, M. Rahman and M.M. Hussain, 2000. Assessing Contribution of Component Technologies in Jute Production, *B. J. Jute Fib. Res.*, 24: 15-18.