CHAPTER VIII

EFFECTIVENESS OF RECOMMENDED MESH SIZE

RESEARCH HYPOTHESIS II

LEVEL OF EFECTIVENESS OF DIFFERENT MESH SIZES

INTRODUCTION

This chapter discusses the results of the hypothesis – II, which is as follows:

H_0: ***The recommended mesh sizes of different gears are the most effective one for the beel fisheries of Assam and there is no significant variation in the level of effectiveness across the different beels of Assam.***

H_1: ***The mesh sizes other than the recommended one are the most effective for the beel fisheries of Assam and the level of effectiveness varies from beel to beel.***

The recommended mesh size of nets as per the *'Assam Fisheries Rules, 1953'* (Phukan, 2001) is a follows:

1. The use of net with less than 1 cm. Bar/2 cm. mesh *Musarijal* in size is prohibited in any fishery throughout the year: Provided that this restriction may be relaxed by the Deputy Commissioner/Sub Divisional Officer for the catching of smaller species like, *Mowa, Puthi, Sella, Carati,* etc., between the first day of the month of May and the fifteenth day of the month of July, both days inclusive.
2. The use of *Berjal/Mahajal* or *Fasijal* or any type of net with meshes less than 7 cm. Bar/14 cm. mesh is prohibited during breeding season beginning from the first day of the month of May and ending on the fifteenth day of the month of July, both days inclusive in any proclaimed fishery: Provided that this restriction may be relaxed by the State Government for *Hilsa* fishing only.

Similarly, the recommended mesh sizes in Hirakud Reservoir as per Khan et al. (1980) are as follows:

1. Simple gill nets of mesh size 25 to 30 mm. are highly suited for the capture of smaller species like, *G. chapra, O.cotio cotio, E.vacha* etc.
2. Framed gill nets ranging from 75 to 105 mm. are highly effective for the capture of larger species like, *S. silondia, L. fibriatus, C. mrigala, and Catla catla*

REVIEW OF LITERATURE

The effect of mesh size on the fishery in respect of trawls and gill nets were extensively studied by many workers from time to time such as Russel, et al. (1926), Hodgson (1933), Baranav (1948), Holt (1957), Oslen (1979), Aoyama (1961), Joseph et al. (1964), Sulochanan et al. (1968), Hamley (1975), Akio Fujushi (1980), and Mruthyunjaya (1982). Rout et al. (1986) studied on the effectiveness of mesh size and concluded that larger mesh sized gill nets (120 to 135 mm) are economically more effective in case of stagnant cultured fisheries. Khan et al. (1980) studied on different mesh sizes of gill nets and suggested that smaller mesh sizes (25 to 30 mm) are more effective in capturing of smaller fish species and larger mesh sized gill nets (75 to 80 mm) are highly effective to capture larger fish species in Hirakud Reservoir, Orissa. Similarly, Govt. of Assam also issued some rules and regulations regarding the conservation and management of beel fisheries vide *'Assam Fisheries regulation Act, 1953'* (Phukan, 2001).

METHODOLOGY

To study the level of effectiveness of different mesh sizes of gears on the basis of cost and return analysis the requisite data have been collected from the beels using the

same questionnaire as for chapter-V. To estimate the level of effectiveness on the basis of perception of fishermen responses have been recorded in five categories, such as most effective (+++), effective (++), partially effective (+), not effective (0) and harmful (-).

OBSERVATIONS

RECOMMENDED MESH SIZE OF NETS IN THE BEELS OF ASSAM

Table 8.1 shows the recommended mesh size fishing nets available in the beel fisheries of Assam. Of the entangling nets (Gill nets) *Goroi langi,* which belongs to recommended mesh size of 25 to 30 mm. is found in 33 beels of Assam. It is observed in maximum number of beels (9 beels) in Morigaon district followed by Karimgunj (7 beels), Dhubri (6 beels), Cachar (4 beels), Golaghat (3 beels), Darrang (3 beels), and Nalbari (1 beel).

Ari langi, which also belongs to recommended mesh size of 75 mm. is found in 44 beels and is observed in maximum beels (9 beels) of Morigaon district followed by Karimgunj and Dhubri (7 beels), Nagaon and Golaghat (5 beels), Cachar (4 beels), Sibsagar, Kamrup and Darrang (2 beels), and Hailakandi (1 beel).

Ilisha phansi with its mesh size of 25 to 30 mm. also belongs to recommended mesh size and has been observed in 43 beels during the study period. It is found in maximum beels of Golaghat district (8 beels) followed by Morigaon (7 beels), Karimgunj and Dhubri (5 beels), Nagaon, Cachar and Darrang (4 beels), and Kamrup, Nalbari and Sibsagar (2 districts).

Likewise, *Rau phansi* (mesh size, 105 mm.) is observed in 51 beels of Assam. In Golaghat district it is found in maximum beels (8 beels), which is followed by Dhubri, Morigaon and Karimgunj (7 beels), Nagaon and Cachar (5 beels), Kamrup

Table-8.1 Recommended mesh size of fishing nets in the beels

Gears	Mesh Size (mm.)	Category	District	Beels (Total Nos.)
Goroi langi	25 – 30	Entangling Gear (Gill net)	Morigaon	Mori, Bormonoha, Jaluguti, Kasodhora, Kujibalipatti, Deora, Thekera, Udori, and Nandini-Karmari. **Total Nos. 9**
			Karimgunj	Rani-Megna, Sagar, Gopharchang, Angang, Sone beel, Rata, and Saitali. **Total Nos. 7**
			Dhubri	Kalidanga, Hakama, Nandini, Harinchora, Barundanga, and Bhoispuri. **Total Nos. 6**
			Cachar	Salchapra, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 4**
			Golaghat	Pungani, Moridisoi, and Bihdia. **Total Nos. 3**
			Darrang	Batha, Mailata-Diplinga, and Gathia. **Total nos. 3**
			Nalbari	Btua-kamakhya. **Total No. 1**
Ari langi	70 – 75	Entangling Gear (Gill net)	Morigaon	Mori, Bormonoha, Jaluguti, Kasodhora, Kujibalipatti, Deora, Thekera, Udori, and Nandini-Karmari. **Total Nos. 9**
			Karimgunj	Rani-Megna, Sagar, Gopharchang, Angang, Sone beel, Rata, and Saitali. **Total Nos. 7**
			Dhubri	Kalidanga, Nandini, Harinchora, Barundanga, Jogra and Bhoispuri, Chandakhal. **Total Nos. 7**
			Nagaon	Lakhanabandha, Satiyan, Siyalckhaity, Dighali-patali, and Brahmamaijan. **Total Nos. 5**
			Golaghat	Pungani, Ganak-dubai-duba, Goroimari-bihdia-jopora, Botalikhosa, and Bihdia. **Total Nos. 5**

			Cachar	Baskandi, Salchapra, Sibnarayanpur, and Tapang. **Total Nos. 4**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
			Kamrup	Deepar, and Solmari. **Total Nos. 2**
			Darrang	Raumari, and Gathia. **Total Nos. 2**
			Hailakandi	Digar-bakri. **Total No. 1**
Ilisha phansi	25 – 30	Entangling Gear (Gill net)	Golaghat	Pungani, Ganak-dubai-duba, Goroimari-bihdia-jopora, Merkolaberia, Tinsuli-borbil, Botalikhosa, and Bihdia. **Total Nos. 8**
			Morigaon	Mori, Bormonoha, Kasodhora, Deora, Thekera, Udori, and Nandini-Karmari. **Total Nos. 7**
			Karimgunj	Rani-Megna, Gopharchang, Sone beel, Rata, and Saitali. **Total Nos. 5**
			Dhubri	Kalidanga, Nandini, Barundanga, Jogra and Bhoispuri. **Total Nos. 5**
			Nagaon	Lakhanabandha, Satiyan, Dighali-patali, and Brahmamaijan. **Total Nos. 4**
			Cachar	Salchapra, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 4**
			Darrang	Batha, Roumari, Mailata-Diplinga, and Gathia. **Total Nos. 4**
			Kamrup	Deepar, and Solmari. **Total Nos. 2**
			Nalbari	Borbila, and Botua-kamakhya. **Total Nos. 2**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
Rau phansi	105	Entangling Gear (Gill net)	Golaghat	Pungani, Ganak-dubai-duba, Goroimari-bihdia-jopora, Merkolaberia, Moridisoi, Botalikhosa, and Bihdia. **Total Nos. 8**

			Dhubri	Kalidanga, Nandini, Harinchora, Barundanga, Jogra, Chandakhal, and Bhoispuri. **Total Nos. 7**
			Morigaon	Mori, Bormonoha, Jaluguti, Deora, Thekera, Udori, and Kujibalipatti. **Total Nos. 7**
			Karimgunj	Rani-Megna, Sagar, Gopharchang, Angang, Sone beel, Rata, and Saitali. **Total Nos. 7**
			Nagaon	Lakhanabandha, Satiyan, Siyale khaity, Dighali-patali, and Brahmamaijan. **Total Nos. 5**
			Cachar	Salchapra, Sibnarayanpur, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 5**
			Kamrup	Deepar, Siligurijan, and Solmari. **Total Nos. 3**
			Darrang	Batha, Roumari, and Gathia. **Total Nos. 3**
			Nalbari	Borbila. and Botua-kamakhya. **Total Nos. 2**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
			Barpeta	Sagmara. **Total No. 1**
			Hailakandi	Digar-bakri. **Total No. 1**
Karal phansi	130 – 140	Entangling Gear (Gill net)	Dhubri	Kalidanga, Hakama, Nandini, Harinchora, Barundanga, Jogra, Chandakhal, and Bhoispuri. **Total Nos. 8**
			Golaghat	Pungani, Ganak-dubai-duba, Goroimari-bihdia-jopora, Merkolaberia, Moridisoi, Botalikhosa, and Bihdia. **Total Nos. 8**
			Karimgunj	Rani-Megna, Sagar, Gopharchang, Angang, Sone beel, Rata, and Saitali. **Total Nos. 7**
			Cachar	Salchapra, Sibnarayanpur, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 5**

			Nagaon	Lakhanabandha, Satiyan, Siyale khaity, Dighali-patali, and Brahmamaijan. **Total Nos. 5**
			Darrang	Batha, Roumari, and Gathia. **Total Nos. 3**
			Kamrup	Deepar, Siligurijan, and Solmari. **Total Nos. 3**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
			Nalbari	Borbila. and Botua-kamakhya. **Total Nos. 2**
			Barpeta	Sagar. **Total No. 1**
Musarijal	1.0 – 1.5	Encircling Gear	Morigaon	Mori, Bormonoha, Jaluguti, kasodhora, Kujibalipatti, Deora, Thekera, Udori, and Nandini-karmari. **Total Nos. 9**
			Dhubri	Kalidanga, Hakkama, Harinchora, Barundanda, Bhoispuri, Jogra, and Chandakhal. **Total Nos. 7**
			Golaghat	Pungani, Goroimari-bihdia-jopora, Merkolaberia, Tinsuliboril, Moridisoi, Botalikhosa, and Bihdia, . **Total Nos. 7**
			Karimgunj	Rani-Megna, Sagar, Gopharchang, Angang, Sone beel, and Rata. **Total Nos. 6**
			Cachar	Salchapra, Sibnarayanpur, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 5**
			Nagaon	Lakhanabandha, Satiyan, Siyale khaity, Dighali-patali, and Brahmamaijan. **Total Nos. 5**
			Darrang	Batha, Roumari, Mailata-diplinga, and Gathia. **Total Nos. 4**
			Nabari	Borbila, and Botua-kamakhya. **Total Nos. 2**
			Kamrup	Siligurijan, and Deepar beel. **Total Nos. 2**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
			Barpeta	Sagmara. **Total No. 1**

			Hailakandi	Digar-bakri. **Total No. 1**
Berjal	25 - 30	Encircling Gear	Dhubri	Kalidanga, Hakama, Nandini, Harinchora, Barundanda, Bhoispuri, Jogra, and Chandakhal. **Total Nos. 8**
			Cachar	Salchapra, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 4**
			Golaghat	Pungani, Ganak-Dubai-Duba, Botalikhosa, and Bihdia. **Total Nos. 4**
			Nagaon	Satiyan, and Dighali-patali. **Total Nos. 2**
			Karimgunj	Rani-Megna and Gopharchang. **Total Nos. 2**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
			Kamrup	Deepar beel. **Total No. 1**
			Morigaon	Thekera. **Total No. 1**
			Hailakandi	Digarbakri. **Total No. 1**

and Darrang (3 beels), Nalbari and Sibsagar (2 beels), and Barpeta and Hailakandi (1 beel).

Karal phansijal (mesh size, 130 to 140 mm.), which also belongs to recommended mesh size is found in 44 beels of Assam. In this case Dhubri and Golaghat district showed the maximum number of beels (8 beels) where it is available. These two beels are followed by Karimgunj (7 beels), Cachar and Nagaon (5 beels), Darrang and Kamrup (3 beels), Sibsagar and Nalbari (2 beels), and Barpeta (1 beel).

Musarijal, which belongs to encircling gear has a mesh size of 1.0 to 1.5 mm. and is observed in 51 beel fisheries of Assam. It is found in maximum beels of Morigaon district (9 beels) followed by Dhubri and Golaghat (7 beels), Karimgunj (6 beels), Nagaon and Cachar (5 beels), Darrang (4 beels), Nalbari, Kamrup and Sibsagar (2 beels), and Barpeta and Hailakandi (1 beel).

Similarly, *Berjal* with its mesh size of 25 to 30 mm. also belongs to recommended mesh size of nets. During the study period it is observed in 25 beels of Assam. Dhubri district showed the maximum use of this mesh sized *Berjals* where it is found in 8 beels followed by Cachar and Golaghat (4 beels), Nagaon, Sibsagar and Karimgunj (2 beels), Morigaon, Kamrup, and Hailakandi (1 beel).

NON-RECOMMENDED MESH SIZE OF NETS IN THE BEELS OF ASSAM

Table 8.2 shows the non-recommended mesh size of fishing nets available in the beel fisheries of Assam. *Puthi langi,* which has non-recommended mesh size of 8 to 10 mm. is observed in 24 beels of Assam. It is observed in maximum beels of Cachar district (5 beels) followed by Golaghat and Karimgunj (4 beels), Dhubri and Morigaon (3 beels), Nagaon and Kamrup (2 beels), and Darrang district (1 beel).

Table-8.2 Non-Recommended mesh size of fishing nets in the beels

Gears	Mesh Size (mm.)	Category	District	Beels (Total Nos.)
Puthi langi	8 - 10	Entangling Gear (Gill net)	Cachar	Salchapra, Sibnarayanpur, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 5**
			Golaghat	Pungani, Ganak-Dubai-Duba, Botalikhosa, and Bihdia, . **Total Nos. 4**
			Karimgunj	Rani-Megna, Sagar, Sone beel, and Rata. **Total Nos. 4**
			Dhubri	Kalidanga, Nandini, and Chandakhal. **Total Nos. 3**
			Morigaon	Mori, Bormonoha, and Nandini-karmari. **Total Nos. 3**
			Nagaon	Lakhanabandha, and Satiyan. **Total Nos. 2**
			Kamrup	Solmari, and Deepar beel. **Total No. 2**
			Darrang	Batha. **Total No. 1**
Mola langi	12.5	Entangling Gear (Gill net)	Dhubri	Kalidanga, Hakama, Nandini, Harinchora, Barundanda, Bhoispuri, Jogra, and Chandakhal. **Total Nos. 8**
			Morigaon	Mori, Jaluguti, kasodhora, Deora, Thekera, and Nandini-karmari. **Total Nos. 6**
			Cachar	Salchapra, Sibnarayanpur, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 5**
			Karimgunj	Rani-Megna, Sone beel, and Rata. **Total Nos. 3**
			Golaghat	Merkolaberia, Tinsuliborbil, and Bihdia, **Total Nos. 3**
			Darrang	Batha, and Raumari. **Total Nos. 2**
			Kamrup	Siligurija, and Solmari. **Total Nos. 2**
			Nalbari	Borbila. **Total No. 1**

			Sibsagar	Teliadanga. **Total No. 1**
Kaoi langi	15 - 17	Entangling Gear (Gill net)	Dhubri	Kalidanga, Hakama, Nandini, Harinchora, Barundanda, Bhoispuri, Jogra, and Chandakhal. **Total Nos. 8**
			Golaghat	Pungani, Merkolaberia, Tinsuliboril, Moridisoi, Botalikhosa, and Bihdia, . **Total Nos. 6**
			Morigaon	Mori, Jaluguti, kasodhora, Deora, Thekera, and Nandini-karmari. **Total Nos. 6**
			Nagaon	Lakhanabandha, Satiyan, Siyalekhaity, Dighali-patali. **Total Nos. 4**
			Darrang	Batha, Roumari, Mailata-diplinga, and Gathia. **Total Nos. 4**
			Kamrup	Solmari, Siligurijan, and Deepar. **Total Nos. 3**
			Karimgunj	Rani-megna, Sone, and Saitali. **Total Nos. 3**
			Cachar	Salchapra, and Baskandi. **Total Nos. 2**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
			Nalbari	Butua kamakhya. **Total No. 1**
			Barpeta	Sagmara. **Total No. 1**
			Hailakandi	Digar-bakri. **Total No. 1**
Sittica langi	40.0	Entangling Gear (Gill net)	Morigaon	Mori, Bormonoha, Jaluguti, Kasodhora, Kujiballipati, Deora, Thekera, Udori, and Nandini-karmari. **Total Nos. 9**
			Golaghat	Pungani, Ganak-duba-duba, Merkolaberia, Tinsuliboril, Moridisoi, Botalikhosa, and Bihdia, . **Total Nos. 7**

			Karimgunj	Rani-Megna, Gopharchang, Angang, Saitali, Sagar, Sone beel, and Rata. **Total Nos. 7**
			Nagaon	Lakhanabandha, Satiyan, Siyalekhaity, Dighali-patali, and Brahmamaijan. **Total Nos. 5**
			Cachar	Salchapra, Sibnarayanpur, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 5**
			Dhubri	Kalidanga, Hakama, Harinchora, Bhoispuri, and Chandakhal. **Total Nos. 5**
			Nalbari	Borbila, and Botua-kamakhya. **Total Nos. 2**
			Kamrup	Siligurijan, and Deepar. **Total Nos. 2**
			Darrang	Batha, Mailata-Diplinga. **Total Nos. 2**
			Sibsagar	Teliadanga, and Moridikhow. **Total Nos. 2**
			Barpeta	Sagmar. **Total No. 1**
Ari phansi	150 – 165	Entangling Gear (Gill net)	Morigaon	Mori, Bormonoha, Kasodhora, Kujiballipati, Deora, Thekera, Udori, and Nandini-karmari. **Total Nos. 8**
			Golaghat	Pungani, Ganak-duba-duba, Merkolaberia, Tinsuliboril, Gorimari-Bihdia-Jopora, Moridisoi, Botalikhosa, and Bihdia, . **Total Nos. 8**
			Dhubri	Kalidanga, Nandini, Hakama, Barundanga, Bhoispuri, and Chandakhal. **Total Nos. 6**
			Nagaon	Lakhanabandha, Satiyan, Siyalekhaity, Dighali-patali, and Brahmamaijan. **Total Nos. 5**

			Cachar	Salchapra, Sibnarayanpur, Baskandi, Auti-Bauti, and Tapang. **Total Nos. 5**
			Darrang	Batha, Raumari, Mailata-Diplinga, and Gathia. **Total Nos. 4**
			Kamrup	Solmari, Siligurijan, and Deepar beel. **Total Nos. 3**
			Nalbari	Borbilla, and Botua-kamakhya. **Total Nos. 2**
			Barpeta	Sagmara. **Total No. 1**
			Sibsagar	Teliadanga. **Total No. 1**
			Hailakandi	Digar-bakri. **Total No. 1**

Mola langi (12.5mm) on the other hand, has been observed in maximum beels of Dhubri district (8 beels) and is followed by Morigaon (6 beels), Cachar (5 beels), Karimgunj and Golaghat (3 beels), Darrang and Kamrup (2 beels), and Nalbari and Sibsagar district (1 beel). Thus it has been observed in a total number of 31 beels of Assam.

Kaoi langi, which also belongs to non-recommended mesh size (15 to 17 mm.), has been found in 41 beels of Assam. It is observed in maximum beels of Dhubri district (8 beels) followed by Golaghat and Morigaon (6 beels), Nagaon, Darrang (4 beels), Kamrup (3 beels), Cahar, Karimgunj and Sibsagar (2 beels), and Nalbari, Barpeta and Hailakandi (1 beel).

In case of *Sittica langi,* which has the non-recommended mesh size hasa been observed in 47 numbers of beels of Assam. Morigaon district showed the use of the gear in maximum beels (9 beels). It is followed by Golaghat and Karimgunj (7 beels), Nagaon, Cachar and Dhubri (5 beels), and Nalbari, Kamrup, Darrang and Sibsagar districts (2 beels), and Barpeta (1 beel).

Likewise, *Ari phansi* with its mesh size of 150 to 165 mm. also belongs to non-recommended mesh sized nets in the beel fisheries of Assam. It is found in a total number of 44 beels. Morigaon and Golaghat district showed the maximum use of this mesh sized gill nets (8 beels), which are followed by Dhubri (6 beels); Nagaon and Cachar (5 beels); Darrang (4 beels); Kamrup (3 beels); Nalbari (2 beels); and Barpeta, Sibsagar and Hailakandi districts (1 beel).

EFFECTIVENESS OF RECOMMENDED MESH SIZE OF NETS

The level of effectiveness of recommended mesh size of fishing nets (Table-8.5) has been worked out on the basis of cost and return analysis (Table-8.3) and on the perception of fishermen (Table-8.7). The results of the analysis are as follows:

Effectiveness based on Cost and Return Analysis

The level of effectiveness on the basis of cost and return analysis of different recommended mesh size gill nets (phansijals and langijals) and encircling nets (musarijal and berjal) has been shown in Table-8.3. The mesh size of *Goroi langi* (25.0 to 30.0 mm) falls within the recommended mesh size of simple gill nets, i.e., 25.0 to 30.0 mm. Out of 9 beels *Goroi langi* is found most effective in all the 9 beels (100%). Thus it is found as effective gear showing all the economic criteria within the feasible range. Similarly, the analysis shows that out of 14 cases *Ari langi* (m.s., 70.0 to 75.0 mm) is effective in all the cases.

Among the Phansijals, the mesh size of *Ilisha phansi* (25.0 to 30.0 mm) belongs to the recommended mesh size of simple gill nets. The economic analysis on the basis of CTOR (Capital Turn Over Ratio), ROR (Rate of Return), NPV (Net Present Value), BCR (Benefit-Cost Ratio), IRR (Internal Rate of Return) and NKR (Net Investment-Benefit Ratio) shows that the gear is able to provide benefit at least cost, i.e., effective in all the 8 beels where it is found in operation during the study period. *Rau phansi* (m.s., 105 mm), on the other hand, is found in 15 beels and in all the cases the gear is found effective in all economic criteria. Likewise, *Karal phansijal* with its mesh bar 130 to 140 mm is found as most effective in all the 16 beels where the study was conducted.

Among the encircling gears *Musarijal* possesses the smallest mesh size, i.e., 1.0 to 1.5 mm. The economic analysis on the basis of certain criteria such as CTOR, ROR, NPV, BCR, IRR, and NKR as have been worked out in chapter-IV and V. Table-8.3 shows that *Musarijal* is most effective in 46 beels (90.19%) out of 51 beels. In another 4 beels (07.84%) certain economic parameters are found below the viable range, hence it is considered as partially effective (Table-8.3). In another one case (01.96%) the gear is found as affective because the economic parameters like CTOR, ROR, BCR, IRR, and NKR are found below the feasible range. Moreover, the NPV is found in negative.

Table-8.3 Economic analysis of recommended mesh size of fishing nets

Gear	Beel	CI (Rs.)	Depr. (Rs.)	TO C. (Rs.)	TC (Rs.)	TR (Rs.)	PAT (Rs.)	CTOR	ROR	NOI (Rs.)	PBP	T.Cat./Y	Days	CPGH (Kg)	NPV.(Rs.)	BCR	IRR	NKR
Goroi langi	Hakama	4800	561.9	7980	8511.9	13860	5348 1	2.88	1 11	5910	0 81	630	180	0.129	30644 2	6.76	117	7.38
	Barundanga	4700	558.32	7940	8498 32	13860	5361.68	2.95	1.14	5920	0.79	630	180	0.129	30050	5.56	110	7.39
	Botua-kamakhya	4650	495 83	19900	20395.83	23760	3364.17	5.1	0.72	3860	1 2	1080	240	0 083	18217 05	4 2	77	4 92
	Jaluguti	4700	508.78	10170	10678.33	18480	7801 67	3 93	1.66	8310	0.57	840	120	0 129	45633.6	8.86	164	10·71
	Thekera	4600	504 75	7820	8324.75	8910	585.25	1 94	0.13	1090	4.22	405	90	0.083	1199.7	1.21	17	1.26
	Mondisoi	4700	533 33	5200	5733.33	8470	2736.67	1.8	0.58	3270	1.44	385	110	0.064	14436	3.48	65	4 07
	Batha	4300	468.77	5380	5848.77	10560	4711.23	2 46	1.09	5180	0.83	480	120	0 148	26501	5.76	110	7.16
	Mailata-dipling	4850	545.83	7950	8495 83	13860	5364.17	2.86	1.1	5910	0.82	630	170	0 137	30390 75	5.91	111	7 27
	Gathia	4800	441.66	11450	11891 66	16632	4740 34	3.46	0.98	5182	0.93	756	140	0.1	26802.88	6 08	104	6 58
Ari langi	Jogra	4950	570 83	6450	7020 83	10780	3759 17	2.17	0.76	4330	1.14	490	140	0.128	20865.27	4 51	82	5 21
	Chandakhal	4950	544 44	7170	7714 44	13200	5485.56	2.67	1.11	6030	0.82	600	160	0 138	31388 27	6.28	114	7 34
	Deepar	4950	570.83	6450	7020.83	9000	1979.17	1 8	0 39	2550	1.92	360	120	0.111	9847 07	2.65	48	2.98
	Bormoncha	5300	552.78	15920	16472 78	18700	2227 22	3.53	0 42	2780	1.9	850	190	0.092	12096 38	3 36	57	3.52
	Kujibalipatti	5250	541.66	11725	12268 66	20020	7933 34	3 81	1.51	8475	0.62	910	140	0.12	46430 7	8.7	150	9.84
	Udon	5300	575	5360	5935	15840	9905	2 99	1.87	10480	0.51	720	120	0 111	58308	9.88	183	12
	Tapang	5600	689 28	8125	8814 28	11088	2273.72	1.98	0 41	2963	1.89	504	180	0.103	11597 63	2.72	50	3.07
	Digarbakri	5100	608.33	7250	7858 33	9680	1821.67	1.89	0 36	2430	2.1	440	160	0 101	8798.38	2.41	45	2.72
	Pungani	5350	563.88	7375	7938.88	11220	3281.12	2.09	0.61	3845	1.39	510	85	0 111	17108.4	3 56	66	4 19
	Ganak-Dubai-Duba	5000	517 85	6200	6717.85	9240	2522.15	1 85	0 5	3040	1.64	420	140	0.111	13297 9	3.41	59	3.66
	Goroima-Bihdia-Jopora	5300	552.78	5550	6102.78	8470	2367.22	1.59	0 45	2920	1.82	385	110	0 064	11943 28	2.95	53	3.25
	Teliadanga	5100	546 43	3845	4391 43	5280	888.57	1 04	0 17	1435	3 56	240	80	0.111	3159 01	1.55	24	1.62
	Mondikow	5200	530 55	7330	7860.55	12155	4294 45	2.34	0.83	4825	1.08	552.5	85	0 12	23555.26	4.74	64	5.53
	Rauman	4950	544.44	7170	7714 44	13200	5485.56	2.67	1.11	6030	0.82	600	160	0.138	30925.65	5.83	111	7.31
Ilisha phansi	Kalidanga	4350	480.54	5370	5850.54	10560	4709 46	2.43	1.08	5190	0 84	480	120	0.148	26942 62	6.19	113	7 26
	Nandini	4250	505 94	4250	4755 94	5544	788 06	1.3	0 18	1294	3.28	252	90	0.103	3379.91	1 73	27	1 79
	Barundanga	3800	366.66	6100	6466 66	7700	1233.34	2 03	0 32	1600	2 38	350	140	0 092	5952.02	2.5	42	2.56
	Bhoispuri	4450	502.77	6250	6752.77	10780	4027 23	2.42	0.9	4530	0 98	490	140	0.129	23109 43	5 68	99	6 19
	Nandini-karmari	4150	454 16	4380	4834.16	7315	2480 84	1 76	0.6	2935	1.41	332.5	95	0 129	13688 36	4 06	69	4.29
	Baskandi	4350	574.99	7750	8324.99	17820	9495.01	2.18	2 18	10070	0 43	810	180	0.083	57552.69	13.03	226	14 23
	Raani-Megna	4150	508.32	6550	7058.32	13200	6141 68	3.18	1 48	6650	0 62	600	150	0 074	36684 21	9.18	157	9 84
	Gopharchang	4100	508.32	17300	17808 32	18480	671 68	4.45	0 16	1180	3.52	840	210	0.074	2874.91	1.65	26	1 7

Rau phansi	Hakama	4900	590.47	7950	8540.47	15048	6507 53	3.07	1.33	7098	0 69	684	180	0.14	38101.16	7.5	137	8.77
	Jogra	5100	553 33	6300	6853 33	11704	4850 67	2.29	0.95	5404	0.94	532	140	0.14	27793.5	5 91	103	6.45
	Chandakhal	5250	690.47	5400	6090 47	7920	1829.53	1.51	0 35	2520	2 08	360	120	0.111	9715.55	2.65	47	2.85
	Deepar	5100	553.33	6300	6853.33	12075	5221.67	2 4	1.02	5775	0.89	525	140	0.138	30089 99	6 32	110	6.89
	Mori	5450	565	7150	7715	10560	2845	1.94	0.52	3410	1.59	480	160	0.111	8986.63	2.51	43	2.65
	Jaluguti	4800	493.33	6300	6793.33	7700	906 67	1 6	0.19	1400	3 43	350	140	0.092	3460.72	1.66	26	1.72
	Kuji	5300	535	6320	6855	8470	1615	1.59	0.3	2150	2.47	385	140	0.101	7176.98	2.17	39	2.35
	Thekara	4900	513.33	7120	7633.33	10560	2926.67	2.16	0.59	3440	1.42	480	160	0 111	15520.04	3.66	67	4.17
	Siyalekhaity	5200	676.18	9200	9876 18	13167	3290.82	2.53	0.63	3967	1.31	598 5	210	0.052	18747.81	4.23	74	4.61
	Auti-Bauti	5500	958.32	7800	8758.32	10890	2131 68	1.98	0 39	3090	1.78	495	180	0 05	12613 9	2.94	54	3.29
	Ganak Dubai duba	5700	615	11900	12515	15120	2605	2.65	0.46	3220	1.77	630	140	0.083	12984.52	2 87	45	3.28
	Merkolabena	5000	666 66	7450	8116 66	11495	3378 34	2.29	0.67	4045	1.24	522.5	95	0.101	18479.45	3 82	74	4.69
	Mondisoi	4900	558 33	5200	5758 33	14520	8761 67	2.96	1.79	9320	0 53	660	110	0.222	51855 34	9.88	179	11.58
	Mondikhow	5350	545	6310	6855	10010	3155	1.87	0.59	3700	1.45	455	140	0 12	17122.39	3.96	68	4 2
	Raumari	5250	690 47	5400	6090.47	7920	1829.53	1.57	0 35	2520	2.08	360	120	0.111	9715.55	2.65	46	2 85
Karal phansi	Sagmara	4850	503 33	7920	8423 33	11088	2664.67	2 29	0 55	3168	1 53	504	180	0.103	14379.31	3.75	64	3.99
	Borbilla	4900	513.33	7520	8033.33	13090	5056.67	2.67	1.03	5570	0 88	595	170	0.129	29122 36	6 43	111	6.94
	Botua-kamakhya	4950	523 33	6350	6873 33	8750	1876.67	1.77	0 38	2400	2.06	350	140	0 092	3234.73	1.59	25	1.65
	Silgurijan	6000	777.77	10980	11757 77	12870	1112 23	2.14	0 18	1890	3.17	585	130	0.083	4685.9	1.67	28	1.78
	Bormonoha	5450	565	6375	6940	8470	1530	1.56	0.28	2095	2.6	385	140	0.101	7036.78	2.18	37	2.29
	Deora	4950	523 33	7110	763 33	10560	2926.67	2.13	0.59	3450	1.43	480	160	0.111	15468.08	3 63	67	4.16
	Udon	5450	565	7120	7685	9680	1995	1 78	0.37	2560	2.13	440	160	0 101	9347.07	2.45	44	2 71
	Sibnarayanpur	5100	700	3050	3750	4950	200	0.97	0.24	1900	2 68	225	60	0 069	6103.74	2.07	35	2 19
	Tapang	5200	608 33	5700	6308.33	12540	6231.67	2.41	1.19	6840	0 76	570	120	0 175	36778.79	7.62	128	8.07
	Digar-bakri	5200	733 33	5400	6133.33	7128	994 67	1 37	0.19	1728	3	324	120	0.1	4269.4	1.74	28	1.82
	Sagar	5600	741.66	6750	7491.66	13200	5708 34	2.35	1.01	6450	0.87	600	150	0.074	33768.24	6.48	112	7 03
	Pungani	5700	717 85	10980	11697 85	20020	8322 15	3.51	1.46	9220	0 62	910	130	0.129	49363.15	8.1	149	9.66
	Goroiman-Bihdia-Jopora	5700	615	9300	9915	15400	5485	2.7	0.96	6100	0.93	700	100	0.129	30811.72	5.43	100	6.41
	Telladanga	5500	660.71	3855	4515 71	7920	3404 29	1.44	0.62	4065	1.35	360	80	0 083	18821.49	4.13	71	4 42
	Batha	4900	590 47	7950	8540 47	15048	6507 53	3.07	1.33	7098	0.69	684	185	0.137	65630 25	8.2	140	8.87
	Gathia	4900	513.33	7520	8033.33	13090	5056 67	2.67	1.03	5570	0 88	595	180	0.123	29122.38	6.44	111	6.94

Musanjal	Kalidanga	36000	5333	129200	134533	393750	259217	0.09	7.2	264550	0.14	15750	210	0.156	1591432.5	35 49	93	45.2
	Hakama	45000	5833 33	50800	56633.33	105000	48366.67	2.33	1.07	54200	0.83	4200	120	0.109	274907	6.8	90	7.11
	Hann	28000	3733.32	41800	45533.32	67500	21966.68	2.41	0.78	25700	1.08	2700	120	0 087	125003.8	4.7	87	5.46
	Barun	27000	3650	47800	51450	82250	30800	3.04	1.14	34450	0.78	3290	140	0.092	180166.3	6.45	120	7.6
	Bhoispun	44000	6000	40600	46600	51250	4650	1.16	0.1	10650	4.13	2.25	90	0.071	11791.5	1.21	23	1 26
	Jogra	55000	8750	79500	88250	138750	50500	2.52	0.91	59250	0.93	5550	150	0.096	285772 5	4.5	94	6.19
	Chanda	39000	5750	76200	81950	256500	174550	6.58	4 47	180300	0 22	10260	180	0.178	1061466	20.44	410	28.22
	Sagmara	19500	2150	19300	21450	28125	6675	0.47	0 34	8825	6.8	1125	45	0.078	32847 05	2.56	44	2.68
	borbila	37500	4875	70700	75575	82250	6675	2 19	0.17	11550	3 25	3290	140	0 061	26395.5	1 58	26	1 7
	B. Kamak.	24000	3111	71900	75011	112875	37863.91	4.7	1.57	40975	0.58	4515	210	0.083	221320 05	7.85	154	10 22
	Siligun	41000	6450	73000	79450	187500	108050	4 57	2.63	114500	0.36	7500	125	0.133	6703.9	1.3	257	1.41
	Depar	39000	5750	76200	81950	144900	62950	3.7	1.61	68700	0.57	6900	230	0 078	384693.9	7 78	156	10.5
	Mon	21000	25883.33	47400	49983.33	213750	163766.67	7.79	10.17	166650	0.12	8550	190	0.234	1002470 1	37 8	724	48.7
	Bormon	45000	5833	98900	104733	148750	44017	3.3	0.98	49850	0 9	5950	170	0.078	247980 5	5.09	100	6.51
	Jaluguti	50500	8097.22	61900	69997.22	114000	44002.78	2.26	0.87	52100	0 97	4560	120	0.098	242895.8	4.05	87	3.85
	K.dhora	57500	9652.77	51300	60952.77	100000	39047.23	1.74	0.68	48700	1.18	4000	100	0 104	207574	3 21	71	4.6
	Kuji	49000	7555 5	47600	55155.5	135000	79844.5	2.75	1.63	87400	0.56	5400	120	0 156	466021	7.21	153	10.51
	Deora	44000	6000	42500	48500	78000	29500	1.77	0.67	35500	1.24	3120	120	0 101	165613	4.06	76	4.76
	Thekera	42500	6875	46700	53575	67500	13925	1.59	0.32	20800	2.04	2700	90	0.078	65464	2.03	42	2.54
	Udori	42000	6000	46200	52200	115500	63300	2.75	1.5	69300	0.6	4620	110	0 131	368257.8	7 06	145	9.77
	N.karman	34500	5043.33	103800	108843.35	360000	251156 65	10 43	7.27	256200	0.13	14400	180	0.178	1539405.1	34.12	675	46.27
	L.bandha	19500	1958 33	52000	53958.33	136500	82541 67	7	4.23	84500	0.23	5460	210	0.135	497838.3	20.74	396	26.53
	Satiyan	30500	2300	45200	47500	60000	12500	1.97	0 4	14800	2.06	2400	120	0.069	53295.7	2 39	45	2.75
	Siyale	37500	4875	54200	59075	84012.5	24937 5	2.24	0.66	29812.5	1.26	3360 5	120	0.087	139443 47	4.09	75	4.71

	D.patali	40000	2916.66	30550	33466 66	38250	4783 34	0.96	0 12	16100	2.17	1530	90	0.066	-5002	0 9	9	0.87
	B maijan	26000	3566.66	41600	45166.66	60000	14833 34	2 31	0.57	18400	1.41	2400	120	0.078	81817	3.55	67	4.15
	salchap	42500	7589.28	58200	65789.28	131625	65835.72	3 09	1.55	73425	0.58	5265	90	0.13	391212.75	7.18	150	10.21
	Sibnaray	74000	14500	34100	48600	135750	87150	1.83	1.17	101650	0 72	5430	60	0.235	503243.5	4 99	112	7.8
	Baskandi	59000	9777.77	48700	58477.77	117000	58522 23	1.98	0.99	68300	0.86	4680	90	0.135	327398	4.43	97	6.55
	A.bauti	45000	8303.57	77200	85503.57	202500	116996 43	4.5	2.59	125300	0.36	8100	180	0.14	707220.5	11.34	239	16.72
	Tapang	28000	4333.32	41700	46033 32	112500	66466.68	4 02	2.37	70800	0.39	4500	120	0.146	397779.2	10.83	222	15.21
	D.bakri	51000	10321.41	28800	39121 41	70500	31378.59	1.38	0 61	41700	1.22	2800	60	0.163	175941	3.14	68	4.44
	Ranimeg	45000	8303.57	77000	85303 57	168750	83446 43	3.75	1 85	91750	0.49	6750	150	0.117	499546	8.3	175	12.1
	Sagar	47500	8125	17100	25225	60750	35525	1 28	0.75	43650	1.09	2430	90	0 105	262895	3 7	79	5 19
	Gophar	48000	8857.14	106300	115157 14	430500	315342.86	8.96	6 5	324200	0 15	17220	210	0 213	1933852.4	27.5	580	41.28
	Angang	45500	6986.11	41800	48786 11	157500	108713.89	3.46	2.39	115700	0.39	6300	90	0.218	646776 8	10.31	218	15 21
	Sone	45500	6986.11	135400	142386.11	303750	161363 89	6.67	3.5	168350	0.27	12150	270	0.117	972680 3	15.01	317	22.38
	Rata	46000	6888 88	64700	71588 88	81250	9661.12	1.77	0.21	16550	2.78	3250	130	0.065	33577.7	1.49	31	1.73
	Pungani	30500	3652.77	37900	41552.77	68750	27197.29	2.25	0.89	30850	0.99	2750	110	0.097	152146.3	4.92	94	5.99
	G.B Jop.	52000	9142.85	78600	87742.85	118125	30382 15	2.27	0.58	39525	1.32	4725	135	0.078	166674.75	3.13	66	4 2
	M.beria	41000	7464.32	62100	69564 32	125000	55435.68	3 05	1.35	62900	0 65	5000	125	0.104	327563	6.3	132	8.99
	T.borbil	41000	6319.44	78600	84919.44	155250	70330 56	3.79	1.71	76650	0.53	6210	135	0.102	412675.5	7 68	161	11 06
	M.disoi	25000	3250	45500	48750	62500	13750	2.5	0.55	17000	1.47	2500	100	0.071	75164	3.49	60	4
	B.khosa	27000	4678 5	39900	44578.5	150000	105421.5	5 56	3.9	110100	0.25	6000	80	0.195	642046.2	17 26	356	24.78
	Bihdia	28000	4000	43350	47350	91000	43650	3.25	1.56	47250	0.59	3640	130	0.109	254480.7	7.28	149	10.08
	T.danga	25000	3472 22	45700	49172.22	62500	13327.78	2.5	0 53	16800	1.49	2500	100	0 078	68598	2.94	59	3 74
	M.dikhow	54000	8666.66	39600	48266.66	87500	39233.34	1.62	0.73	47900	1.13	3500	100	0 121	211319	3.99	75	4.91
	Batha	38000	5333	129200	134533	393750	259217	0 09	7 2	264550	0.14	15750	190	0.181	1591965	35 91	662	42.89
	M.dip	28000	3733 32	41800	45533.32	67500	21966 68	2 41	0 78	25700	1 08	2700	70	0 082	129836	3.93	81	5.64
	Rauman	39000	5750	76200	81950	256500	174550	6 58	4 47	180300	0.22	10260	120	0 163	1069458	23.95	440	28.42
	Gathia	37500	4875	70700	75575	82250	6675	2.19	0.17	11150	3.25	3290	100	0.073	23856	1.35	22	1.49

Benal	Kalidang	42000	6000	90100	96100	151875	55775	3.61	1.33	61775	0.68	6075	135	0.117	321678.05	6.29	129	8.65
	Hakama	39000	5000	79900	84900	154000	69100	3.95	1.77	74100	0.53	6160	160	0.133	412080	9.84	180	11.57
	Nandini	34000	4933 32	41700	46633 32	136500	89866.68	4.01	2.64	94800	0.36	5460	120	0.236	543693.2	13 61	261	16.99
	Harin	31000	6333.32	63600	69933 32	140625	70691.68	4.54	3.36	77025	0 4	5625	90	0.162	422099.75	8.72	196	14.61
	Barun	24000	3250	60400	63650	83250	19600	3 47	0.98	22850	1 05	3330	120	0.096	108086 9	4.24	85	5.5
	Bhoisp	39000	5000	50000	55000	56250	1250	1.44	0.03	6250	6.24	2250	90	0.086	-7911.5	0.83	7	0.79
	Jogra	34000	4933 32	49100	54033 32	83125	29091.68	2.44	1.17	34025	0 99	3325	95	0.121	167495 95	4.88	93	5.93
	Chanda	37000	4888.88	46400	51288 88	135000	83711.12	3.65	2.26	88600	0 42	5400	90	0 208	497921.8	10.86	215	14.46
	Deepar	34000	4933.32	49100	54033.32	85120	31086 68	2.5	0.91	36020	0.94	3040	95	0.111	179845	5.17	99	6.29
	Thekera	47000	8075	46700	54775	72000	17225	1.52	0.36	25300	1.88	2880	90	0.111	83122	2.13	45	2.75
	Satiyan	33000	5250	71200	76450	97500	21050	2.95	0 63	26300	1 25	3900	120	0.096	111087.8	3.15	68	4.37
	D.patali	35000	5250	32500	37750	48600	10850	1.39	0.31	16100	2.17	2025	90	0.117	54527	2.21	43	2.56
	Salchap	77000	12875	57900	70775	168750	97975	2.18	1 26	110850	0.69	6750	90	0.223	551994.5	5 11	116	8.17
	Baskandi	74000	12000	97600	109600	301625	192025	4.07	2.59	204025	0 36	12065	190	0.218	1163584 7	12.71	253	16.72
	A Bauti	72000	11875	61700	73575	64500	-9075	0 89	-0.13	2800	25 9	2580	120	0.074	-80498	0.177	3.5	-0.11
	Tapang	74000	12000	57100	69100	59125	-9975	0 8	-0.13	2025	36.5	2365	110	0 074	-86795 2	0.126	2.5	-0.17
	D.Bakri	71000	11749 99	49800	61549.99	53425	-8124.99	0 75	-0.11	3625	19.6	2137 5	95	0.078	-73891 25	0 23	4.6	-0.04
	R.Megna	51000	7749 99	32800	40549.99	43875	3325 01	0.88	0 07	11075	4.6	1755	90	0.101	2356 25	1 04	13	1.04
	Gophar	67500	10875	61500	72375	67500	-4875	1	0.07	6000	11.3	2700	120	0 078	-660657	0.41	8	0.21
	Pungani	30500	3652.77	40500	44152.77	90000	45847.23	2.95	1.5	49500	0.62	3600	80	0.156	268089 8	7.99	151	9.94
	G.D Duba	27000	3876.66	27300	31176.66	60000	28823.34	2.22	1.06	32700	0 83	2400	80	0.156	162940.2	5.13	105	7.03
	B khosa	27000	4678 5	39900	44578.5	80000	35421.5	2.96	1.31	40100	0.67	3200	80	0 138	208746 2	6 29	129	8.73
	Bihdia	34000	4933.32	32000	36933.32	55125	18191 68	1 62	0 54	23125	1.47	2205	90	0.127	38124.95	1 88	34	2.12
	T danga	25000	3472 22	45650	49122.22	68750	19627.78	2 75	0.78	23100	1 08	2750	110	0.104	35394	2.29	46	2.83
	M.Dikhow	26000	4190 46	34000	38190.46	62500	24309.54	2.4	0.93	28500	0 91	2500	100	0 13	140021	4.85	97	6.38

Table-8.4 Economic analysis of non-recommended mesh size of fishing nets

Gear	Beel	CI (Rs.)	Depr. (Rs.)	TO C. (Rs.)	TC (Rs.)	TR (Rs.)	PAT (Rs.)	CTOR	ROR	NOI (Rs.)	PBP	T.Cat./Y	Days	CPGH (Kg)	NPV.(Rs.)	BCR	IRR	NKR
Puthi langi	Solmari	250	125	7225	7350	9000	1650	36	6.6	1775	0.14	360	180	0 074	10342.5	17 04	460	42.37
	Lakhanabandha	3850	391.66	4150	4541 66	7425	2883.34	1.93	0.74	3275	1.78	337.5	90	0.069	15869.6	4.6	81	5.12
	Rata	4100	463.08	5640	6103 08	6600	496 92	1.61	0.12	960	4.27	300	120	0.092	1218.78	1 25	18	1 29
	Botalikhosa	4250	506.66	4750	5256.66	5940	683.34	1.39	0.16	1190	3.57	270	100	0.1	2336.55	1.46	73	1 55
Mola langi	Kalidanga	4300	468 77	5380	5848.77	10560	4711.23	2 46	1 09	5180	0.83	480	120	0 148	26932.68	6.24	113	7.26
	Nandini	4400	548.8	7200	7748.8	12320	4571.2	2.8	1.03	5120	0.86	560	160	0.129	25738.34	5.28	107	6.85
	Kasodhora	4250	458 32	10135	10593.32	18480	7886.68	4.35	1.87	8345	0 51	840	120	0.129	47026	9.65	182	12.06
	Merkolabena	4300	469.44	8700	9169 44	9900	730.56	2.3	0.17	1200	3 58	450	100	0 083	1864.8	1.33	23	1.43
	Tinsuliborbil	4300	469 44	11330	11799.44	19305	7505 56	4.49	1.75	7975	0.54	877.5	135	0 12	43802.05	8 87	168	11 18
	Bihdia	4250	541.66	6200	6741 66	9460	2718.34	2.22	0 64	3260	1.3	430	70	0 113	14745.15	3.71	70	4 46
Kaoi langi	Bhoispun	4400	491.66	6420	6911 66	11550	4638.34	2.63	1.05	5130	0.86	525	140	0.138	25933 6	5.45	105	6 89
	Nandini-karmari	4450	563.08	6380	6943.08	7700	759 92	1 73	0.17	1320	3 37	350	140	0.092	3389.37	1.7	27	1.75
	Dighali-patali	4350	433.33	11450	11883.33	17820	5936 67	4 09	1.36	6370	0.68	810	270	0 111	34716 51	8.36	143	8.98
	Salchapra	4400	548.8	6420	6968 8	8470	1501 2	1 92	0.34	2050	2.15	385	140	0 101	7354.04	2.38	44	2.67
	Baskandi	4400	516 66	7990	8506 66	11880	3373 24	2.7	0 77	3890	1.13	540	180	0 111	18743.64	4 51	83	5 26
	Rani-megna	4450	563.08	5620	6183.08	6600	416.92	1 48	0.09	980	4.54	300	120	0.092	628 77	1.11	15	1.14
	Sone	4000	458 32	22500	22958 32	26730	3771 68	6 68	0.94	4230	0 94	1215	270	0 083	21394.2	5.25	99	6 35
	Saitali	4450	563.08	6390	6953 08	7700	746.92	1.73	0.17	1310	3.39	350	140	0.092	2671.47	1 49	24	1 6
Sittica langi	Hannchora	4850	545.83	7950	8495 83	13860	5364 17	2 86	1.1	5910	0.82	630	180	0 129	60849.41	6.38	115	7.36
	Sagamara	4900	533.33	4250	4783 33	6930	2146 67	1.41	0.44	2680	1.8	315	90	0.064	10887 1	2.72	52	3.22
	Borbilla	4800	441.66	11450	11891 66	16632	4740 34	3 46	0.98	5182	0.93	756	270	0.051	26802.88	6 08	104	6.58
	Siliguriian	4900	558.83	7350	7908.33	10560	2651.67	2.16	0 54	3210	1.53	480	160	0.111	13548 8	3.14	59	3.76
	Mori	4800	450	15790	16240	18810	2570	3.92	0.54	3020	1 59	855	190	0.083	13581 98	3.65	62	3.83
	Deora	4900	558 33	7230	7788.33	8800	1011 67	1 79	0.21	1570	3.12	400	160	0.092	3882.24	1 66	28	1.79
	Satiyan	4850	576.18	7140	7716 18	9680	1963 82	2	0.4	2540	1 91	440	160	0 101	9989.11	2.74	49	3.06
	Siyalekhaity	4900	558 33	7080	7638.33	8800	1161.67	1 79	0.24	1720	2.85	400	160	0 092	4811 34	1.82	31	1.98
	Brahmamaijan	4900	590.47	6410	7000 47	10780	3779 53	2.2	0.77	4370	1.12	490	140	0 129	21214.84	4 64	84	4.64
	Sibnarayanpur	4900	558.33	7190	7748.33	9680	1931 67	1 98	0.39	2490	1.97	440	160	0 101	9577.64	2.64	48	2.95
	Auti-bauti	4850	504 16	7980	8484 16	9900	1415.84	2.27	0.33	1920	2 27	450	180	0 092	6651.31	2.27	41	2.53

Asi phansi	Harinchora	4500	458.33	4325	4783 33	6336	1552.67	1.41	0.35	2011	2 24	288	90	0.118	1238.39	1.24	18	1.27
	Kasodhora	4400	471.66	6300	6771.66	8085	1313.34	1.84	0.29	1785	2.47	385	140	0.101	6193.21	2.27	39	2.41
	L.bandhabandha	4400	471.66	6300	6771 66	9240	2468.34	2.1	0.56	2940	1.49	420	140	0.111	13342.66	3.75	65	4.03
	Satıyan	4650	549.99	6725	7274 99	12375	5100	2.66	1.09	5650	0 82	562.5	150	0.138	29994.21	7 02	119	7 45
	Dighali-patali	4800	493.33	6300	6793.33	8470	1676.67	1.76	0.35	2170	2.21	385	140	0.101	8227.02	2.58	44	2.71
	Brahmamaijan	4800	493.33	6310	9803 33	9240	2436.67	1.92	0.5	2930	1 64	420	140	0.111	12931.42	3 48	60	3.69
	Salchapra	4450	481.66	7110	7591 66	8800	1208 34	1.98	0.27	1690	2.63	400	160	0.092	5529.83	2.12	36	2.24
	Angang	4450	481.66	5460	5941.66	6336	394 34	1.42	0 09	876	5.08	288	120	0.088	491.19	1.09	14	1.11
	Tınsuliborbil	4700	531.66	11850	12381.66	13860	1478.34	0.34	0.31	2010	2.34	630	140	0.083	7133 88	2.34	41	2.52
	Botalikhosakhosa	4700	531.66	13500	14031.66	16320	2288 34	3.47	0 49	2820	1.67	680	160	0.078	12147.88	3.28	58	3.58
	Bıhdıa	4500	577.36	8700	5277.36	9460	4182.64	2.1	0 93	760	5.92	650	100	0.12	23925	5.31	99	6 32
	Mailata-Dıplınga	4450	502.77	6250	6752.77	10780	4027 23	2.42	0 9	4530	0.98	288	100	0.106	23109.43	5.68	99	6.19

Likewise, out of 25 beels, *Berjal* (m.s., 25.0 to 30.0 mm) is found most effective in 19 beels (76%) as far as the economic analysis is concerned. Only in one case (4%) the gear is found partially effective. In another 2 beels (8%) it is found as not effective where all the economic criteria are found below the feasible range. Moreover, in 3 beels (12%) the gear is found to be affective where all the economic criteria are found in negative.

Effectiveness based on Perception of Fishermen

Table-8.7 shows the perception of fishermen on the level of effectiveness of different recommended mesh size of gill nets (langijal and phansijal) and encircling nets (*Musarijal* and *Berjal*) in the beels of Assam. The mesh size of *Goroi langi* is found within the recommended mesh size for simple gill nets in Hirakud Reservoir, i. e., 25 – 30 mm. According to the perception of fishermen the gear is found most effective in 23 beels (41.82%), which supports the recommended mesh size. Moreover, in another 12 beels (21.82%) the gear is found effective. Accordingly the study shows that in 8 beels (14.54%) the gear is partially effective but in 12 beels (21.82%) it is found as not effective. The mesh size of *Ari langi* (70 to 75 mm) is larger in comparison to other types of langijal. The study on the level of effectiveness shows that *Ari langi* is most effective in 27 beels (49.09%), and effective in 12 beels (21.82%). Thus, it is evident that the gear is effective in most of the cases, i.e., 39 beels (70.91%) out of 55 beels. In another 9 beels (16.36%) the gear is found in partially effective category whereas in 7 cases (12.82%) it is recorded as not effective.

Among the phansijals *Ilisha phansi* with its mesh bar 25 to 30 mm belongs to the recommended mesh size. As far as the perception of fishermen is concerned the gear is found most effective in 19 beels (34.54%), effective in 17 beels (30.90%), partially effective in 13 beels (23.67%) and not effective in 6 beels (10.90%). In this case also maximum beels show effectiveness of the gear.

As far as the perception of the fishermen is concerned *Rau phansi* (m.s., 107.5 mm) is found most effective in 29 beels (52.72%) whereas effective in 11 beels (20%). Thus the gear is found either most effective or effective in 40 beels (72.72%) showing a high rate of effectiveness over the other types. Only in 7 beels (12.72%) the gear is found to be partially effective. In another 8 beels (14.54%) it is recorded as not effective.

As far as the *Karal phansijal* is concern, which has the mesh bar of 120 to 135 mm, it has been observed that the gear is most effective in 27 beels (49.09%) and effective in 13 beels (23.67%). Only in 10 beels (18.18%) it is found as partially effective. But in 5 beels (09.09%) the gear is reported as not effective. This is due to the non-availability of major fish groups in these beels.

The perception of fishermen on the level of effectiveness of encircling gears (*Musarijal* and *Berjal*) has been shown in table-8.4. Among the encircling gears *Musarijal* has the smallest mesh size (1.0 to 1.5 mm), which are similar to mosquito nets. Due to their smaller mesh size the gear is able to capture all types of fish groups including the fries and fingerlings of Indian Major Carps (IMC). According t the perception of fishermen on the level of its effectiveness, it has been found that the gear is most effective in 25 beels (45.45%), effective in 14 beels (25.45%), and partially effective in 8 beels (14.54%). Further, in 2 beels (03.63%) it has been reported as not effective whereas it reported to be affective in 6 beels (10.90%) out of 55 beels where the present works have been conducted. In these 6 beels the gear is found to deplete fish stock by capturing fries and fingerlings of IMC.

Finally, the study shows that *Berjal* with its mesh size 25 to 30 mm is most effective in 36 beels (65.45%) and effective in 12 beels (21.82%). Thus, the gear has been reported as most effective and effective in 48 beels (87.27%). Only in 4 beels (07.27%) it is found to be partially effective. But in another 3 beels (05.45%) it has been reported as not effective.

Table-8.5 Level of Effectiveness of recommended mesh size of fishing nets on the basis of cost and return analysis

Gears	Category	Mesh Size (mm)	Level of effectiveness	Number of beels	Percent
Goroi langi	Entangling Gear (Gill Net)	25.0 – 30.0	++ + 0 -	09 00 00 00	100 00 00 00
Ari langi	Entangling Gear (Gill Net)	70.0 – 75.0	++ + 0 -	14 00 00 00	100 00 00 00
Ilisha phansi	Entangling Gear (Gill Net)	25.0 – 30.0	++ + 0 -	08 00 00 00	100 00 00 00
Rau phansi	Entangling Gear (Gill Net)	105.0	++ + 0 -	15 00 00 00	100 00 00 00
Karal phansi	Entangling Gear (Gill Net)	130.0 – 140.0	++ + 0 -	16 00 00 00	100 00 00 00
Musari jal	Encircling Gear	1.0 – 1.5	++ + 0 -	46 04 00 01	90.19 07.84 00 01.96
Ber jal	Encircling Gear	25.0 – 30.0	++ + 0 -	19 01 02 03	76 04 08 12

N.B. In the table '++' represents as *Most Effective*, '+' as *Partially Effective*, '0' as *Not Effective*, and '-' as harmful.

Table-8.6 Level of Effectiveness of non- recommended mesh size of fishing nets on the basis of cost and return analysis

Gear	Category	Mesh Size	Level of Effectiveness	Nos. of Beels	Percent
Puthi langi	Entangling Gear (Gill Net)	8.0 – 10.0	++ + 0 -	04 00 00 00	100 00 00 00
Mola langi	Entangling Gear (Gill Net)	12.5	++ + 0 -	06 00 00 00	100 00 00 00
Kaoi langi	Entangling Gear (Gill Net)	15.0 – 17.0	++ + 0 -	07 01 00 00	87.5 12.5 00 00
Sittica langi	Entangling Gear (Gill Net)	40.0	++ + 0 -	11 00 00 00	100 00 00 00
Ari phansi	Entangling Gear (Gill Net)	150 - 165	++ + 0 -	09 02 00 00	81.82 18.18 00 00

N.B. In the table '++' represents as *Most Effective*, '+' as *Partially Effective*, '0' as *Not Effective*, and '-' as harmful.

EFFECTIVENESS OF NON-RECOMMENDED MESH SIZE OF NETS

The level of effectiveness of non-recommended mesh size of fishing nets (Table-8.6) has been worked out on the basis of cost and return analysis (Table-8.4) and on the perception of fishermen (Table-8.8). The results of the analysis are as follows:

Effectiveness based on Cost and Return Analysis

In case of gill nets the mesh size are found between 8.0 mm (*Puthi langi*) to 165.0 mm (*Ari phansi*). Cost effectiveness studies (Table-8.4) shows that out of 4 cases *Puthi langi* with its mesh bar 8.0 – 10.0 mm is found most effective in all the 4 beels (100%). Similarly, *Mola langi* with its mesh bar of 12.5 mm is also found most effective in all the cases where the study was conducted. Likewise, the analysis shows that out of 8 beels *Kaoi langi* (m.s., 15.0 – 17.0 mm) can provide maximum benefit, i.e. most effective in 7 beels (87.5%) where all the economic parameters are found within the viable range. In 1 beels (12.5%) it is found as partially effective where the ROR was found below the economic feasible range. *Sittica langi* (m.s., 40.0 mm) was observed in 11 beels during the study period and are found as effective in all the beels as far as the cost effectiveness study is concern. Likewise, out of 12 beels *Ari phansi*, which has the largest mesh size (150.0 to 165.0 mm) in comparison to other gill nets, is found most effective in 9 beel (81.82%) and partially effective in another 2 beels (18.18%) where CTOR in one beel and ROR in another beel are found below the economic feasible range (Table-8.4).

Effectiveness based on Perception of Fishermen

As shown in the Table-8.8 *Puthi langi* (m.s., 8.0 – 10.0 mm) has been found as most effective in 18 beels (32.72%), effective in 20 beels (36.36%), partially effective in 11 beels (20%) and not effective in 6 beels (10.90%). *Mola langi* with its mesh size of 12.5 mm has been found as most effective in 18 beels (32.71%), effective in 19 beels (34.54%), partially effective in 13 beels (23.33%), and not effective in 5 beels

Table-8.7 Level of Effectiveness of recommended mesh size of fishing nets on the basis of perception of fishermen

Gears	Category	Mesh Size (mm)	Level of effectiveness	Number of Beels	Per cent
Goroi langi	Entangling nets	20 - 25	+++ ++ + 0	23 12 08 12	41.82 21.82 14.54 21.82
Ari langi	-do-	55 - 60	+++ ++ + 0	27 12 09 07	49.09 21.82 16.36 12.73
Ilisha phansi	-do-	25 - 30	+++ ++ + 0	19 17 13 06	34.54 30.90 23.67 10.90
Rau phansi	-do-	107.5	+++ ++ + 0	29 11 07 08	52.72 20.00 12.72 14.54
Karal phansi	-do-	120 – 135	+++ ++ + 0	27 13 10 05	49.09 23.67 18.18 09.09
Musarijal	Encircling nets	1.0 – 1.5	+++ ++ + 0 -	25 14 08 02 06	45.45 25.45 14.54 03.63 10.90
Ber jal	-do-	25 – 30	+++ ++ + 0	36 12 04 03	65.45 21.82 07.27 05.45

N.B. In the table '+++' represents as *Most Effective*, '++' as *Effective*, '+' as *Partially Effective*, '0' as *Not Effective* and '-' as harmful.

Table-8.8 Level of Effectiveness of non-recommended mesh size of fishing nets on the basis of perception of fishermen

Gears	Category	Mesh Size (mm)	Level of Effectiveness	Number of Beels	Per cent
Puthi langi	Entangling Gear (Gill Net)	8.0 – 10.0	+++ ++ + 0	18 20 11 06	45.46 29.10 14.54 10.90
Mola langi	Entangling Gear (Gill Net)	12.5	+++ ++ + 0	18 19 13 05	32.71 34.54 23.66 09.09
Kaoi langi	Entangling Gear (Gill Net)	15.0 – 17.0	+++ ++ + 0	21 17 13 04	38.18 30.90 23.65 07.27
Sittica langi	Entangling Gear (Gill Net)	40.0	+++ ++ + 0	13 18 12 12	23.66 32.72 21.82 21.82
Ari phansi	Entangling Gear (Gill Net)	150.0 – 165.0	+++ ++ + 0	31 12 08 04	56.36 21.82 14.54 07.27

N.B. In the table '+++' represents as *Most Effective*, '++' as *Effective*, '+' as *Partially Effective*, '0' as *Not Effective* and '-' as harmful.

(09.09%). Likewise, the study shows *Kaoi langi* with its mesh size of 15 to 17 mm, are most effective in maximum of the cases (21 beels, i.e., 38.18%) under study. Moreover, the gear is found effective in 17 beels (30.90%), partially effective in 13 beels (23.65%), and finally as not effective in only 4 cases (07.27%). Similarly, according to the perception of the fishermen *Sittica langi* (40.0 mm) is found most effective in 13 beels (23.66%), effective in 18 beels (32.72%), partially effective in 12 beels (21.82%) and not effective in 12 beels (21.82%). Thus, in comparison to recommended one (i.e., mesh size, 25 to 30 mm) the gear with mesh size of 40.0 mm is found less effective as far as the perception of fishermen is concerned.

Finally, among the phansijals *Ari phansi* (m.s., 150 to 165 mm), which has the largest mesh size among the gill nets is reported to be most effective in 31 beels (56.36%) and effective in 12 beels (21.82%). Thus, it is found as most effective and effective in 43 beels (78.18%) out of 55 beels. In another 8 beels (14.54%) the gear is reported as partially effective. But in only 4 beels (07.27%) it is reported as not effective.

DISCUSSION

The study on the availability of recommended mesh size of fishing nets (Table-8.1) shows that *Rau phansi* (m.s. 105 mm) among the gill nets, and *Musarijal* (m.s. 1.0 to 1.5 mm) among the encircling nets are extensively used in the beel fisheries of Assam. Both the gears have been observed in 51 beels during the study period. As far as the availability of other gears are concerned these two gears are followed by *Ari langi* (m.s 70 to 75 mm) and *Kaoi phansi* in 44 beels, *Ilisha phansi* (25 to 30 mm) in 43 beels, *Goroi langi* (m.s. 25 to 30 mm) in 33 beels, and *Berjal* in 25 beels.

As far as the availability of non-recommended mesh sized nets are concerned (Table-8.2) *Sittica langi* (m.s. 40 mm) has been observed in maximum numbers of beels (47

beels, i.e. % of the total sample). It is followed by *Ari phansi* (m.s. 150 to 165 mm) in 44 beels, *Kaoi langi* (m.s. 15 to 17 mm) in 41 beels, *Mola langi* (m.s. 12.5 mm) in 31 beels, and *Puthi langi* (m.s. 8 to 10 mm) in only 24 beels. Thus it is evident from the study that the recommended mesh sized nets are used in more beels in comparison to non-recommended mesh sized nets in the beel fisheries of Assam.

Generally under intensive fish culture in stagnant cultivated water, the periodic harvesting and marketing of fish in small quantities is always desirable for more profit. The economic study on the basis of certain economic criteria such as CTOR, ROR, BCR, NPV, IRR and NKR (Table-8.3) reveals that among the recommended mesh sized nets the gill nets such as *Goroi langi, Ari langi, Ilisha phansi, Rau phansi,* and *Karal phansi* are economically most feasible in the beels of Assam. The study supports the view given by Khan et al. (1980) that the simple gill nets of 25 to 30 mm are highly suited for the capture of smaller species and that gill nets ranging from 75 to 105 mm are highly effective for the capture of larger species of fishes. On the other hand, among the encircling gears *Musarijal* is found effective in maximum beels (46 beels, i.e. 83.64 %) in comparison to *Berjal* (19 beels, i. e. 76%). But both the gears are found to be harmful where the vital economic parameters such as ROR, NPV, and NKR are found in negative. Though the encircling gears such as *Musarijal* and *Berjal* are found economically effective in most of the beels of Asasm (Table-8.5) their application during breeding season (beginning from the 1st day of the month of May and ending on the 15th day of the month of July) is prohibited by the Govt. of Assam, vide Assam Fisheries Rules, 1953 (Phukan, 2001).

As far as the non-recommended mesh sized nets are concerned *Puthi langi, Mola langi,* and *Sittica langi* are found economically effective in respect of all economic criteria (Table-8.4). On the other hand, the level of effectiveness shows that *Kaoi langi* and *Ari phansi* are partially effective in one beel and 2 beels respectively (Table-8.6).

According to the perception of fishermen on the level of effectiveness of recommended mesh sized nets (Table-8.7) it has been observed that larger mesh sized

gill nets, such as *Ari langi* (55 to 60 mm), *Rau phansi* (105 mm), and *Karal phansi* (120 to 135 mm) are most effective in maximum number of beels of Assam in comparison to the smaller mesh size gill nets, such as *Goroi langi* (25 to 30 mm) and *Ilisha phansi* (25 to 30 mm). The study also supports the findings of Rout (1986) that the operation of gill nets with mesh size of 120 to 135 mm are more suited for the effective harvesting in stagnant cultivated water. Similarly, among the encircling gear *Berjal* (25 to 30 mm) has been observed as most effective in maximum beels (36 beel, i.e. 65.45% of the total surveyed beel) in comparison to *Musarijal* (25 beels, i.e. 45.45% of the total surveyed beel). Moreover, *Musarijal* is also found as harmful in 6 cases (10.90%).

The study on the perception of fishermen of the non-recommended mesh size of nets (Table-8.8) reveals that the level of effectiveness of *Ari phansi* (150 to 165 mm), which has the largest mesh size in comparison to the other fishing nets, is most effective in maximum numbers of beels (31 beels, i.e. 56.36%).

CONCLUSION

The present work on the level of effectiveness of recommended mesh size and non-recommended mesh size of fishing nets revels that among the recommended mesh sizes larger mesh size gill nets, such as *Ari langi* (55 to 60 mm), *Rau phansi* (105 mm), and *Karal phansi* (120 to 135 mm) are highly effective in the beel fisheries of Assam in comparison to the smaller mesh size gill nets, such as *Goroi langi* (25 to 30 mm), and *Ilisha phansi* (25 to 30 mm). Among the recommended encircling nets *Berjal* is found as the most effective net as far as the perception of fishermen is concerned. But according to the economic analysis *Musarijal* is found to be effective in most of the beels. On the other hand, among the non-recommended mesh sizes *Ari langi* (150 to 165 mm) is found as the most effective net as far as the study on perception of fishermen and economic analysis is concerned.

Thus the findings on the basis of economic analysis support the hypothesis that the recommended mesh sizes of different gears are the most effective one for the beel fisheries of Assam and there is no significant variation in the level of effectiveness across the different beels of Assam. But the study on the perception of fishermen revels the there are significant variations in the level of effectiveness across the different beels. Moreover, the mesh sizes other than the recommended one are also found effective in the beel fisheries of Assam. Therefore, null hypothesis cannot be rejected according to the present findings.