

An Internship Report on

**SMALL SCALE AQUACULTURE PRACTICES AND ITS IMPACT ON SOCIO-ECONOMIC
STATUS OF KAWASOWOTI VDC, NAWALPARASI**

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1. Introduction:

Nepal has huge fish production potential as it has water resources of 812000 ha including lakes, reservoir, paddy field, ghols, rivers and ponds. Almost all of the water resources are underutilized and utilized resources i.e. ponds have nominal productivity (less than 3 MT). Lower production and productivity leads nepali to consume only 1.71kg easily digestible nutritious fish which is rich in Ca, Fe, protein and polyunsaturated fatty acid. Nepal has short supply of fish from its domestic production so we are force to import more than 80% age fish from other country mainly India (Tiwari, 2008).

Nepal is a country of village which composed of many ethnic group. Some of them are inhabitant of water resources like THARU. More than 60 %age of child below 5 years are suffered from malnutrition. Human development indicator like education, health, economy is also very poor in this community.

The huge water resource of Nepal need to mänge by local dwellers most of them are poor. Promotion of small scale aquaculture in such localities provide nutritious fish to community on one hand, and in another and most important thing is it provide household employment, women empowerment, awareness, all of them help to improve human development indicator including alleviation of child malnutrition. The surplus fish produced in household pond can be sold in local market which fetch income in one hand also help to cut fish import from other country.

1.1. Background

Nawalparasi District, a part of Lumbini Zone, is one of the seventy-five districts of Nepal. Parasi is its district headquarters, It covers an area of 2,162km² and has a population of 562,870 (CBS,2001). The midpoints of Nepal's east west highway (Mahindra Highway) lie in this district. Nawalparasi has human development indicator of 0.336 which is 36th position among 75 district of Nepal (Thapa, 1995).

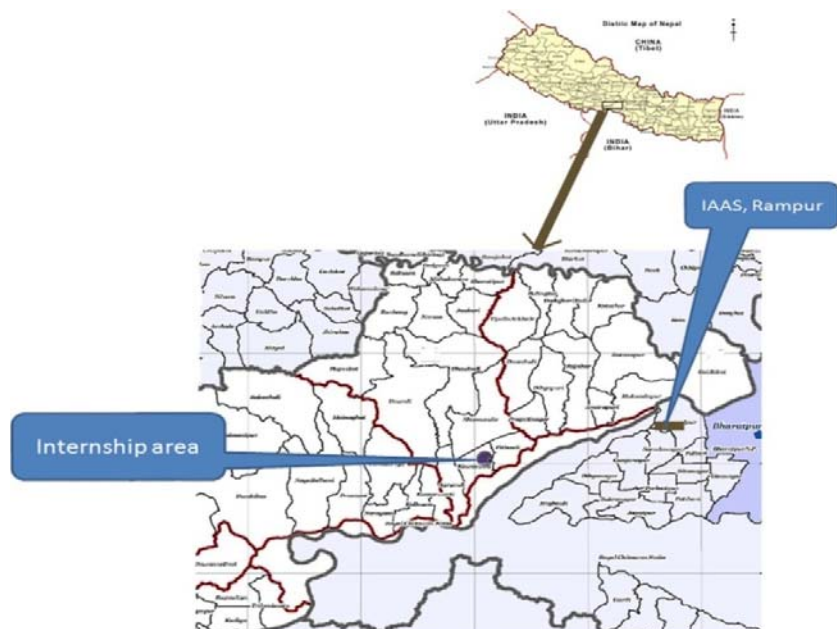


Fig 1: District map of Nepal showing the internship area and IAAS

Kawaswoti is one of the village development committee of Nawalparasi. It is one of the main resident of ethnic community, THARU. They are poor and also have poor HDI. As Nawalparasi is rich in water resources, these resources if utilise on behalf of these community through suitable model like women in aquaculture as small scale aquaculture this can be measure to remedy child malnutrition, supportive for child education and in cumulative can improve the human development indicator.

Kawaswoti ward no 3 and 4 were selected as internship site of myself under EU Aqua Internship programme through Institute of Agriculture and Animal Sciences, Chitwan, Nepal. I studied Kawaswoti Female Fish Farming Cooperatives Ltd, how it function, and what are the major problem of small scale aquaculture. During 6 month of internship period I also study the socio-economic status of farmer and relative contribution of small scale aquaculture to them.

As small scale aquaculture program was initiated by women in aquaculture project which EU through Kawaswoti Female Fish Farming Cooperatives Ltd. Kawaswoti Nawalparasi. The project was launched in three phase i.e. phase I, phase II and phase III. The project lunched its program in marginal; disadvantage and ethnic community of Kawaswoti VDC ward no 3 and 4 of Nawalparasi district. This program has impact on that community and brings some conclusion which I described later on.

Ward no 3 and 4 of Kawaswoti is situated at southern part of Nawalparasi in attachment with Chitwan national park. The area has year round spring water availability. The cooperative have 44 household as member and had constructed 48 ponds with average area of 107 sq. m.(40 – 565sq.m.) with standard deviation of 87.06.

All of the members of this cooperative are female from disadvantage group with average household labour per family is 4.47. The cooperative is composed with 73% THARU, 20% BOTE and 7% MAGAR. All family are involved in agriculture, besides they also involved in government job, foreign employment and other employment like driving rickshaw, carpenter, mason etc. 22.5% of families are purely involved in agriculture, besides, 17.5%, 15%, 45% families are involved in agriculture and government job, agriculture and foreign and agriculture and other employment respectively.

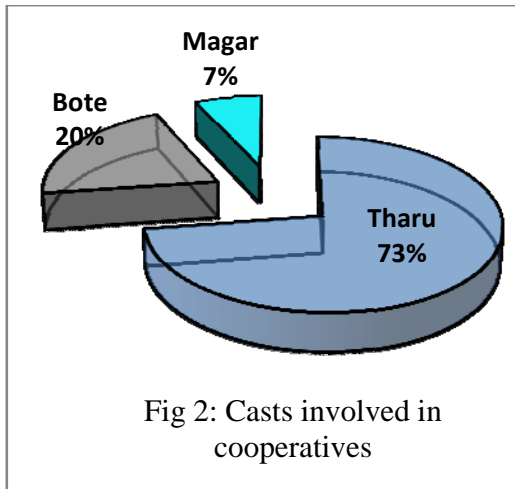


Fig 2: Casts involved in cooperatives

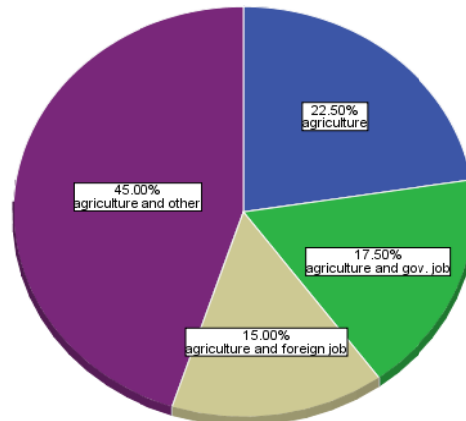


Fig 3: Involvement of families in different employment

Most of the farmer are marginal and have average land holding of 0.35 ha with dissimilar land distribution. Land holding is from 0.03 ha to 2.17ha with standard deviation of 0.43054. Only 36 % of family have year round food availability. Most of family i.e. 41% have suffered from severe food deficiency and food availability is only for 0 to 4 month, and 23% of family have food sufficiency for 5 to 8 month.

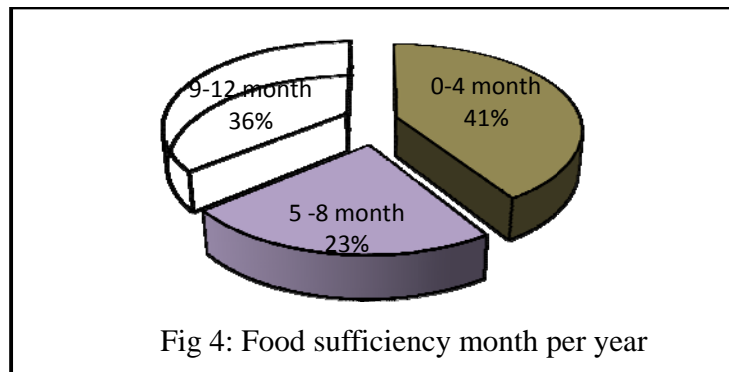


Fig 4: Food sufficiency month per year

2. Cooperative's activity:

The cooperative is structured with one main committee and three sub-committee. Committees are responsible to each other which makes cooperative functional and active.

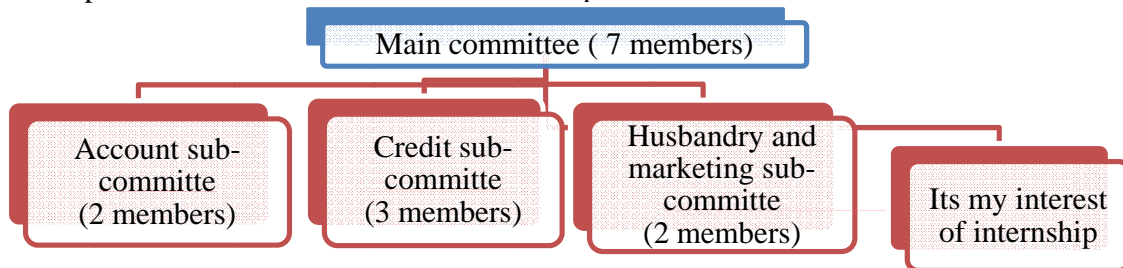


Fig 5: Flow diagram of working mechanism of cooperatives with indication of my study area.

They organise general assembly each year and formulate strategy, fix goal for this year with reformation of committee. They organise group meeting at 14th (according to BS) of each month. They save 50 rupees per month and involved in microcredit and finance. They allocate credit to the member of cooperative according to the group decision with relatively lower interest rate. They also conduct other social works like awareness campaign.



Fig: cooperative member organizing meeting

3. Result

3.1. Fish species cultured:

Different farmer stock different species in their ponds. Common, rohu, grass carp, silver carp, naini, bighead carp and tilapia are the stocked species. The stocking of species mainly depends on preference to particular fish. Common is the most preferred species and it gets 27% votes while bighead carp is the least preferred species and it gets only 0.427 % votes. The ranking was done according to preference chart for different species.

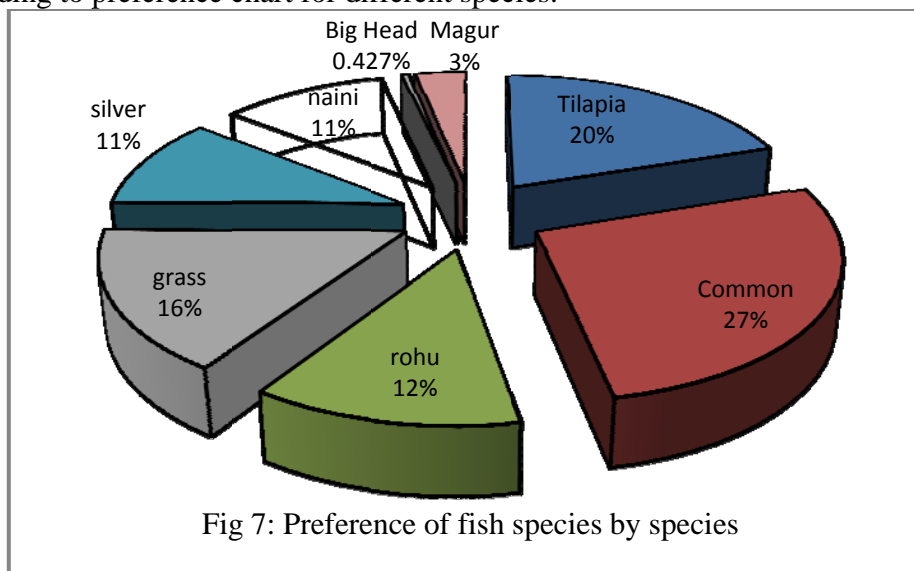


Fig 7: Preference of fish species by species

3.2. Husbandry and marketing:

They stock fingerlings and don't supply any input except kitchen waste. Most of them don't perform pond reclamation activity like pond drying, liming and manuring. That is the region which leads very low productivity of 1514.94 kg per hectare. 54% of fish production was utilized for household consumption and 3% were allocated for free gift to neighbor. Only 43% of the fish production was sold which fetch 1124 rupees of average income per family. They sold fish mostly at their farm gate directly to consumer, but some of them brought their product to the local market (HAT BAZZAR) for sale. I found no complex marketing chain of wholesaler, retailer, and consumer that may be due to low production scale.

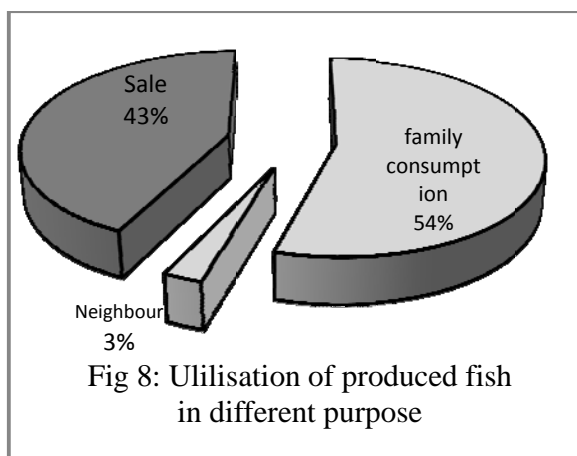


Fig 9: A farmer harvesting fish from his pond

3.3. Fish health:

Fish farming is extensive and semi-extensive. The stocking densities and amounts of fertilizer and feeds added to fishponds are relatively low. Consequently, fish health is generally good from seed to harvested adults. The only exception to this has been sporadic outbreaks of epizootic ulcerative syndrome (EUS), a complex of primary and secondary infections by viruses, bacteria, and fungi that can result in ulcerated fish or cause mass mortality. EUS affected only to Indian major carp, Chinese carp, tilapia and common carp were found not infected. Farmers were found not serious about disease.



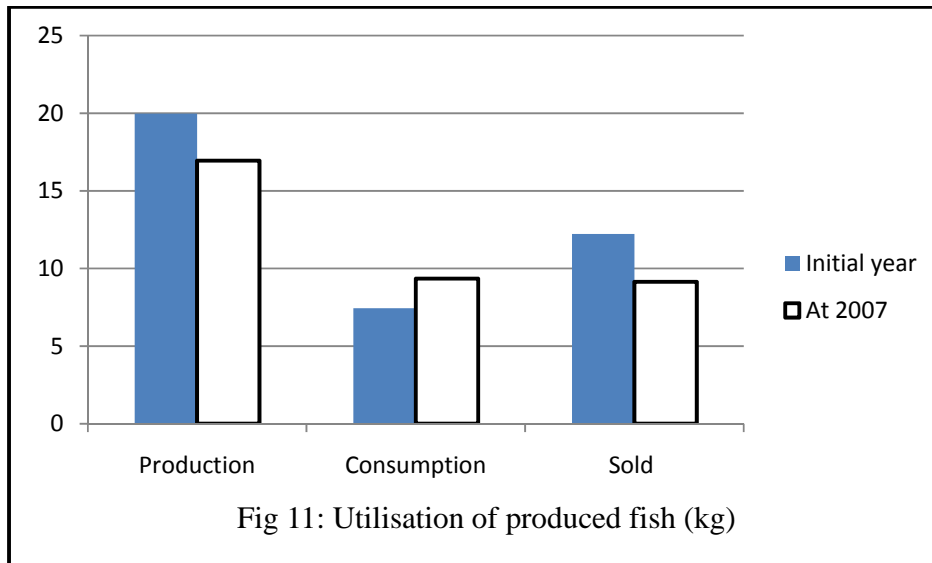
Fig 10: Fish infected with

3.4. Fish production, consumption, sale, and free gift to neighbor

Fish production is decline from 19.97kg to 16.95kg per family in comparison with initiation of project and at termination phase of project. The decline is significant ($p = 0.018$) which may be due to no effort of farmer for pond reclamation. Fish consumption is significantly ($p .008$) increased from 7.45 to 9.35 kg/family which has direct impact on reduction in fish sale from 12.22 to 9.15kg. But this reduction is statistically not significant ($p = 0.130$).

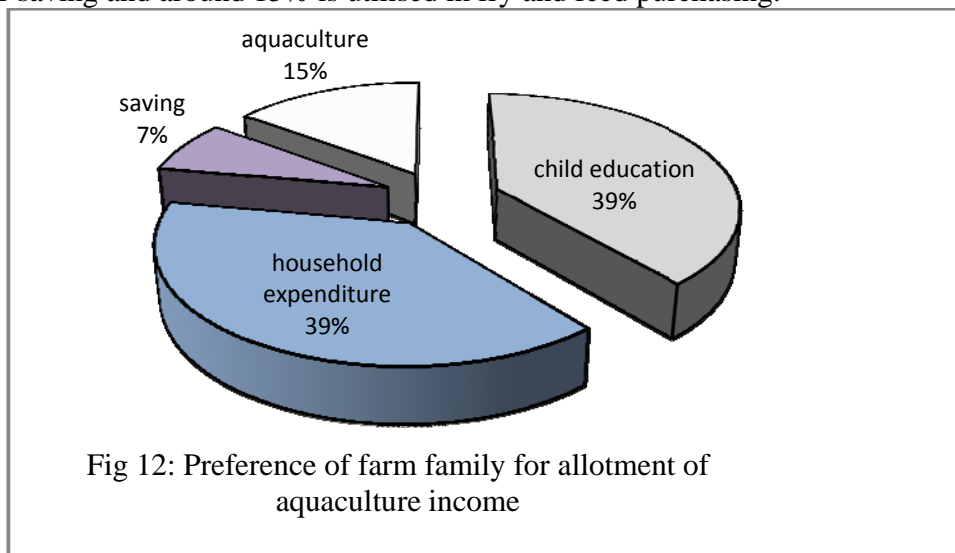
Table 1: production, consumption, sale and free gift of fish to neighbor at the initial year of project and at termination (2007) phase of project.

| | Allotment of fish kg/family | | | |
|-----------------|-----------------------------|-------------|----------|------------------------|
| | Production | Consumption | Sold | Free gift to neighbour |
| Initial year | 19.975 | 7.45 | 12.225 | 0.3 |
| At 2007 | 16.95 | 9.35 | 9.15 | 0.45 |
| Correlation (r) | .804 | .724 | .309 | .378 |
| SD | 7.77401 | 4.31931 | 12.57875 | 12.57875 |
| P value | .018 | 0.008 | .130 | .130 |



3.5. Income and its contribution to farm family:

Besides nutritious fish small scale aquaculture also provides income to the family. The families have the average household income of NRs 1289.875. this is utilised for child education, household expenditure like salt, soap, oil etc, saving, paying loan and interest, purchasing fry and also feed to fish and livestock. Income has most contribution to child education and household expenditure. Each of child education and household expenditure utilised 39% income while 7% is used for saving and around 15% is utilised in fry and feed purchasing.



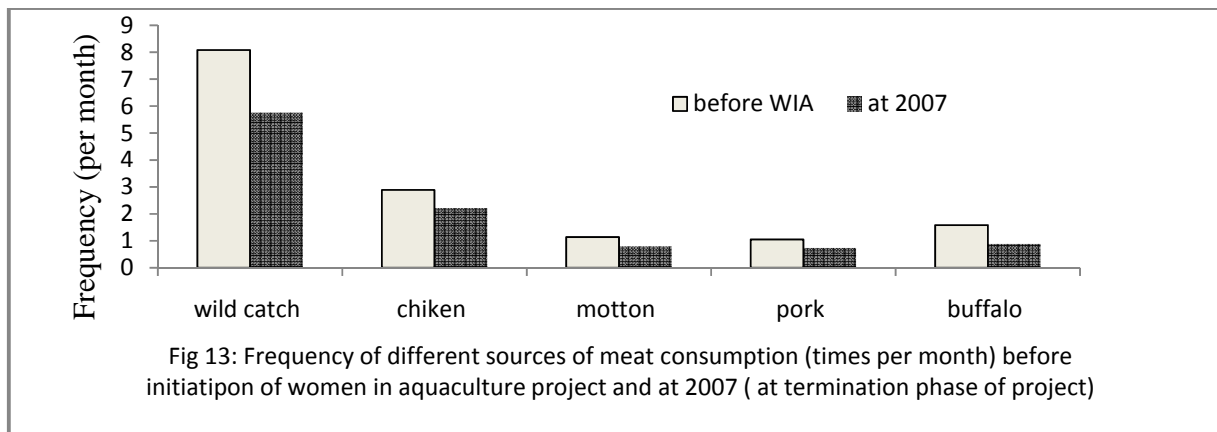
3.6. Frequency of meat consumption:

Community utilised wild catches of fish, crab, snail, mutton, buffalo meat, pork, and chicken as meat sources. Before the small scale aquaculture project they used wild catches of fisheries at the frequency of about 8 per month but after project fishery consumption frequency is significantly ($p= 0.000$) reduced to 5.75. That may reduce the fishing pressure on natural water bodies and

flourish biodiversity. The frequency of mutton, chicken, pork and buffalo meat consumption is also significantly reduced after the project which causes reduction of family expenditure. These saving can be utilised in other farm sources.

Table 2: Frequency of different sources of meat consumption per month before and after the women in aquaculture small scale aquaculture project.

| | Meat consumption times per month | | | | |
|----------------|----------------------------------|----------|-----------|---------|----------|
| | Wild catch | chicken | mutton | pork | buffalo |
| Before project | 8.08125 | 2.88750 | 1.13895 | 1.05320 | 1.58525 |
| After project | 5.75208 | 2.21030 | .79680 | .73452 | .8811 |
| SD | 2.542085 | 1.754363 | 1.0184955 | .834772 | 1.681274 |
| r | .959 | .653 | .758 | .857 | .888 |
| p | .000 | .019 | .040 | .021 | .012 |



3.7. Relationship between production, productivity, pond area and land holding:

Production has positive and significant ($p = 0.000$) correlation with pond area. For more production in quantity it is necessary to increase total pond area.

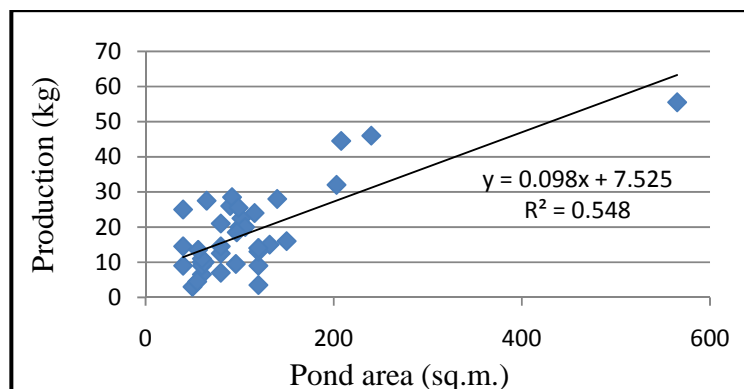


Fig 14: Relationship between pond area and production

Productivity is decreased with increased pond area although the relation is not significant ($p = 0.156$). This result guides us to work on small area pond rather than the large pond.

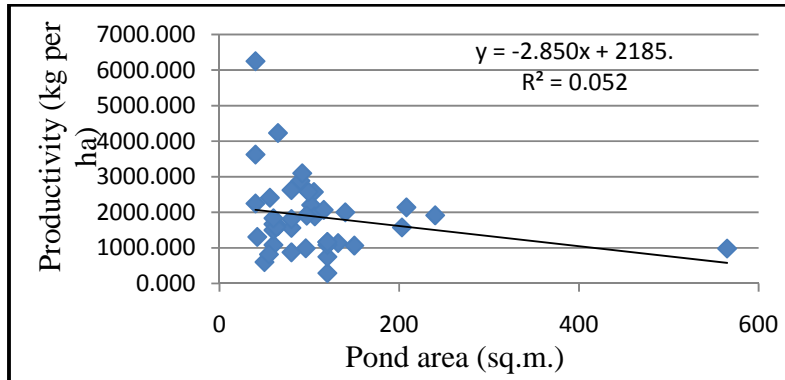


Fig 15: Effect of pond area on pond productivity.

Productivity is found decrease in the family who have more land holding. Although the relation is not significant ($p = 0.899$), the result provides as great idea to implement such small scale aquaculture the community who have less land holding i.e. small farmer.

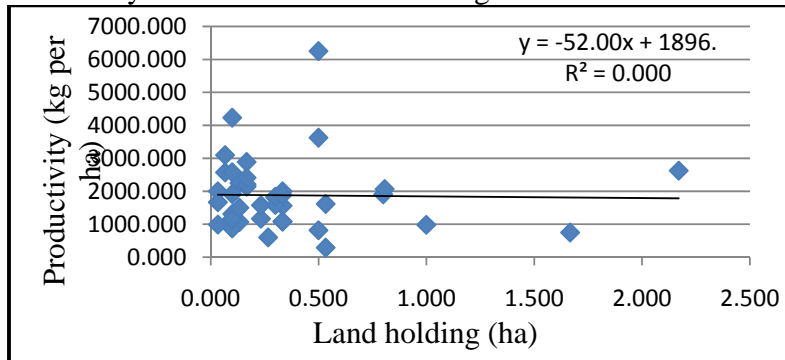


Fig 16: Relationship between family land holding and pond productivity.

Productivity is positively related ($r = 0.053$) with household labour but the relationship is non significant ($p = 0.747$)



Fig 17: Relationship between productivity and household labour force.

4. Benefit of small scale aquaculture

The major benefit obtained by the community are point out below

- Frequent and easy consumption to family
- Free and easy guest serves
- Income from selling
- House hold expenditure like oil, soap, salt, etc.
- Consumption of own farm fish save the of purchasing time
- Kitchen waste are utilised as feed to fish.
- Program aware people about social and economic aspect.

5. Disadvantages and difficulties of fish farming

- Severity of snakes and BAKULLA
- Frequent refilling of pond due to seepage and evaporation
- Less time for household work
- Pond dike destruction
- Flooding
- Disease and no effective control measure
- No land for vegetable
- All time watching

6. Lesson learned

- Small scale aquaculture is powerful tool for mainstreaming and empowering women.
- Promotion of aquaculture into the marginal community can achieve great success in socio economic improvement as child education, food security, awareness, saving and people health.
- Besides protein, fish from small pond can fetch remarkable income
- Enhancing small scale aquaculture is more powerful and effective in the area where the farmers have less land holding.
- Enhancing small pond is more productive than establishing large ponds.
- Small scale aquaculture reduce pressure on natural water bodies for wild catch.

7. Conclusion/Recommendation

- Small scale women in aquaculture program are effective for women empowerment, food security, child education and household income.
- The program is more successful to less land holding and small size ponds.
- Internship program guide student from student life to professional life (Post PG).
- Farmers of many part of Nepal are poor so it is recommended to extend small scale aquaculture in other wter resource rich part of the country.
- Continuation of internship program as it is helpful to develop carrier in future.

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