



The role of public private partnership in the development of fish sector in Nepal

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1. Background

In the recent years, demand for fish, particularly those cultivated locally, has grown in Nepal. Per capita fish consumption in Nepal has increased from 0.3 kg per year in 1982 to about 2.07 kg in 2010¹. The annual demand is around 80,000 MT², as demand has been surging in recent years, production has been struggling to keep with the demand as it is growing at a marginal rate. The mismatch in supply and demand has created a deficit and this deficit is currently being met through import. It is estimated that 80 percent of fish sold in Nepal is imported, mostly from India³.

The productivity of the fish sector through aquaculture is quite low in Nepal. Recent data points out that the productivity is at 4.4 MT per hectare⁴ but, productivity of same species average around 8 to 10 MT per hectare in other regional countries⁵. Low productivity at the farmer level is mostly attributed to low quality seed and availability of feed. To understand the constraints leading to low productivity due to low quality seed in the fish sector, Samarth-NMDP conducted a market research in 2012. The research highlighted brood stock, pond management, hatchery management and feed management as major constraints for low quality seed which leads to low productivity. Public and private hatcheries are both responsible for supplying seed to the market but private hatcheries are the main suppliers of seed, taking 80% market share. Government hatcheries with adequate infrastructure and capacity have been labelled as Nucleus Breeding Centers (NBC) by the government. These NBCs hold pure line brood stock for improving and maintaining the genetic purity. The NBCs are also responsible for breeding the pure brood stock and distributing the first generation brood stock to private hatcheries for seed production.

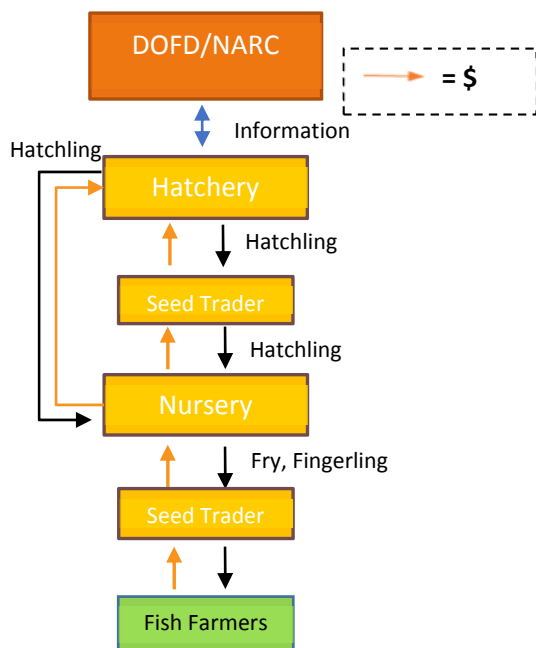


Figure 1: Mapping of role of public and private hatcheries

Public hatcheries:

There are 15 public hatcheries under the supervision of Directorate of Fishery Development (DOFD) and National Agricultural Research Center (NARC). Of the 15 hatcheries 4 have been designated as NBC. DOFD and NARC are the primary players in fish sector in Nepal.

DOFD formulates sectoral policies in coordination with NARC, Ministry of Agriculture; maintains pure line brood stock and supports in technology dissemination to private hatcheries.

NARC is the research body which specializes in agricultural research.

Private hatcheries:

Private hatcheries are the main suppliers of fish seed, supplying more than 80% of the total hatchling, fry and fingerlings. They supply to the nurseries and directly to the farmers as well. There are about 40-45 private hatcheries in Nepal.

¹ FAO 2010; cited in the "pond aquaculture sub-sector analysis and vision" document of Samarth-NMDP

² According to Tulsi Giri, President 2013 - 2016, Fisheries Association of Nepal

³ According to Tulsi Giri, President 2013 - 2016, Fisheries Association of Nepal

⁴ Statistical Information on Nepali Agriculture 2013/2014 (2070/071), Government of Nepal Ministry of Agricultural Development Agri Business Promotion and Statistics Division

⁵ According to Rama Nanda Mishra, Director, DOFD 2012

Further analysis was also conducted on the roles of public and private actors to understand the gaps in their performance to improve seed quality. The role of public and private actors was important, however, there were several dysfunctions in their relationships. It was identified that there was mistrust among them and they were not coordinating and sharing information amongst them to benefit each other. Also, DOFD and NARC did not have a mechanism to maintain the genetic purity or replenish the brood stock as such the brood stock in Nepal deteriorated over the last 60 years. As private hatcheries had limited knowledge on genetics the instances of inbreeding and cross breeding escalated over time, this resulted in seeds with low productivity and high mortality. As private hatcheries were the major supplier of seeds the problems of low productivity and high mortality were reflected across the value chain including farmers.

2. Design of intervention and implementation: Samarth's role as a facilitator

In order to strengthen the relationship with these primary actors, Samarth facilitated meetings with DOFD and NARC to work on improvement of seed quality. DOFD is mandated with maintaining pure line brood stock and breeding them for distribution of the first generation broods to private hatcheries for seed production. Due to high instances of inbreeding and cross breeding the old brood stock was nonexistent, thus The Ministry of Agricultural Development (MOAD) with the technical assistance from FAO and under the supervision of DOFD and NARC brought in six new brood stock species (NBS), 4 from China and 2 from India in 2011 in order to improve the current brood stock and also to develop processes for genetic improvement. Having brought in the pure line brood stock, DOFD and NARC were working on distribution and monitoring mechanism, but nothing was finalised. Over the next 4 years the NBS sat at the NBC and even though breeding of NBS was done they were not distributed to other private hatcheries. The plan was to populate other government hatcheries before it could be distributed to other private hatcheries. This meant that the private hatcheries would not have access to the NBS for another 3-4 years. During the discussion, DOFD and NARC confirmed their lack of confidence among private hatcheries. They believed that private hatcheries did not have the capacity to handle, manage and breed pure line brood stock in their hatcheries.

After a year and a half, next round of discussions with DOFD and NARC was initiated by Samarth. The objective of the discussion was to bring public and private agencies to work together to improve and distribute quality seed. DOFD and NARC confirmed that they required technical assistance to establish distribution and monitoring mechanism of the NBS. However, communication still lagged between public and private hatcheries as the trust between them had not been built yet. A facilitation was required to bring both the parties together to understand each other's requirements and showcase each other's capacity in a forum to build confidence.

After several discussions with DOFD, NARC and the private hatcheries, Samarth reiterated that NBS should be channeled through the private hatcheries. Also, with private hatcheries contributing to 80% of seed distribution in the country it became apparent that quality seed distribution can be accelerated to fish farmers through the private hatcheries in comparison to public hatcheries. DOFD and NARC agreed to have an open discussion session before designing distribution mechanism

Lessons from feed intervention for brood stock:

As per Sector Analysis and Vision, 2012, feed was an important component to improve the quality of brood stock. Post initial meetings with DOFD and NARC, Samarth intervened in feed where Samarth partnered with two feed companies to make feed available to improve breed quality. The pilot was completed after one and half year with a strong recommendation. Feed was an important component but it was necessary to intervene in quality of brood stock before feed.

involving private hatcheries. Samarth agreed to take on the facilitation role of bringing public and private hatcheries together for discussion.

2.1. First step towards the partnership between public and private hatcheries

On Jan 8, 2016, a dialogue was arranged between private and public sectors, the stakeholders involved were DOFD, NARC, private hatcheries, and Fisheries Association of Nepal. After the discussions, all the stakeholders realised that they were functioning independently and could work together to improve and benefit from each other. The public agencies were surprised at hatcheries' improved capacity, even though few upgrades/modifications were required to house the NBS. The private sector players were very happy that they were provided with a platform to share their concerns, advocate their requirements and explore possibilities to work together.

Few concrete decisions that were made during the meeting:

- a) A cost sharing mechanism was developed in coordination with all the stakeholders in which the price of the NBS was fixed at Rs.25/piece and 75% subsidy would be provided on scanner and tags.
- b) A distribution mechanism was also developed in which:
 - i. DOFD would provide first generation brood stock to private hatcheries if they met minimum criteria and improve few requirements of hatcheries in infrastructures.
 - ii. DOFD would provide 300 tagged NBS in the initial phase to the selected private hatcheries based on the cost sharing mechanism developed.
 - iii. If the private hatcheries wanted to have more NBS, they could buy tags independently and DOFD would tag the brood stock for them.

Before the NBS was distributed, selected private hatcheries, representatives from the NBC and a member from FAN were sent to a training at Central Institute of Freshwater Aquaculture (CIFA) in India, to enhance their technical capacities. Both parties agreed to move forward based on the decision.

2.2. Devising business model and partnership agreements with public and private hatcheries

As a technical assistance, Samarth commissioned a research on hatchery assessment to identify gaps in hatcheries and nurseries contributing to poor seed production in Nepal. A hatchery expert from CIFA was assigned to conduct the assessment. The assessment was conducted in 17 carp hatcheries and 23 nurseries. The research recommended that several changes in hatchery management, nursery management and hatchery infrastructure was required before NBS could be transferred from public to private hatcheries. The findings were shared with both public and private hatcheries.

After the assessment, a tripartite agreement was signed between NARC, DOFD and Samarth. The objectives were to strengthen and operationalise new brood distribution from NBC; increase capacity of public and private hatcheries to effectively manage pure brood stock; and develop distribution and monitoring mechanisms. As a part of partnership agreement, Samarth contributed in buying tags and scanner for NBS.

Samarth also partnered with five private hatcheries to enhance their capacity to manage first generation brood stock. The other objective was to strengthen the facilities and improve management practices and advocate it to other hatcheries and nurseries. A selection process was developed in coordination with DOFD, NARC and Samarth to select the five private hatcheries. A total of 10 hatcheries were assessed in

terms of their will, skill, financial capacity and scale up potential. Based on the assessment a score was assigned and five hatcheries were selected, they were: Sahani Matsya Hatchery Farm, Mandal Hatchery Farm, Sanjay Matsya Bhura Utpadan, Mukhiya Matsya Prajanan Farm and BK Matsya tatha Hatchery Farm. The selected five hatcheries supply about 70% of the seeds in market in Nepal. A partnership was signed with all five hatcheries. Both the partnerships with public and private hatcheries had a core objective of supplying and integrating quality seed so that poor farmers and small fish entrepreneurs could benefit both as farmers and consumers through positive change in their income.

3. Outcomes of the partnership

After the implementation, there was significant improvement in the relationship between private and public hatcheries which was close to non-existent before. The relationship between DOFD and NARC was also improved, which was weak before the intervention. Cost sharing and distribution mechanisms which were acceptable both to the private hatcheries and the government was developed to access NBS in the future. In the partnership, DOFD and NARC developed four manuals and provided trainings to private hatcheries on pond management, hatchery management, brood management, feed management, the use of water testing kits, etcetera. They also developed monitoring mechanism for transfer of first generation brood stock to private hatcheries. NBS was distributed to private hatcheries using the cost sharing and distribution mechanism developed 2 years ahead of time. DOFD also incorporated budget for tags in order to manage efficient brood stock management.

The selected 5 private hatcheries made investments to make changes or upgrades in their infrastructures and management capacity. Based on the changes, tagged NBS were handed over to private hatcheries for breeding for the first time in Nepal. With private hatcheries, there was evidences of stronger role from their end to maintain the relationship with the government. With the changes in infrastructure and management there has been significant changes in the productivity at hatchery level as mortality has been reduced from 60% to 10%. Information exchange activities was also introduced between five hatcheries in terms of performance, breeding, management etcetera. For instance, the owner of Mukhiya hatchery spent around 10 days at Sahani hatchery to learn about Pangasius breeding and other hatchery management. The five hatcheries also provided trainings to other hatcheries and nurseries in terms of breeding, hatchery and pond management. As a result, three additional hatcheries copied new changes in their hatcheries and significant productivity changes have been reported.

In partnership with public and private hatcheries, a new breed of Pangasius was introduced in Nepal for the first time. Pangasius is a highly productive species and all the stakeholder in the fish sector feel that this species will help narrow the supply and demand gap. The private and public agencies coordination has brought significant changes in fish sector, so much so that the government has prioritised it as one of its priority sectors. It is encouraging to see these changes and it would be sustainable even when Samarth's role as a facilitator ends.

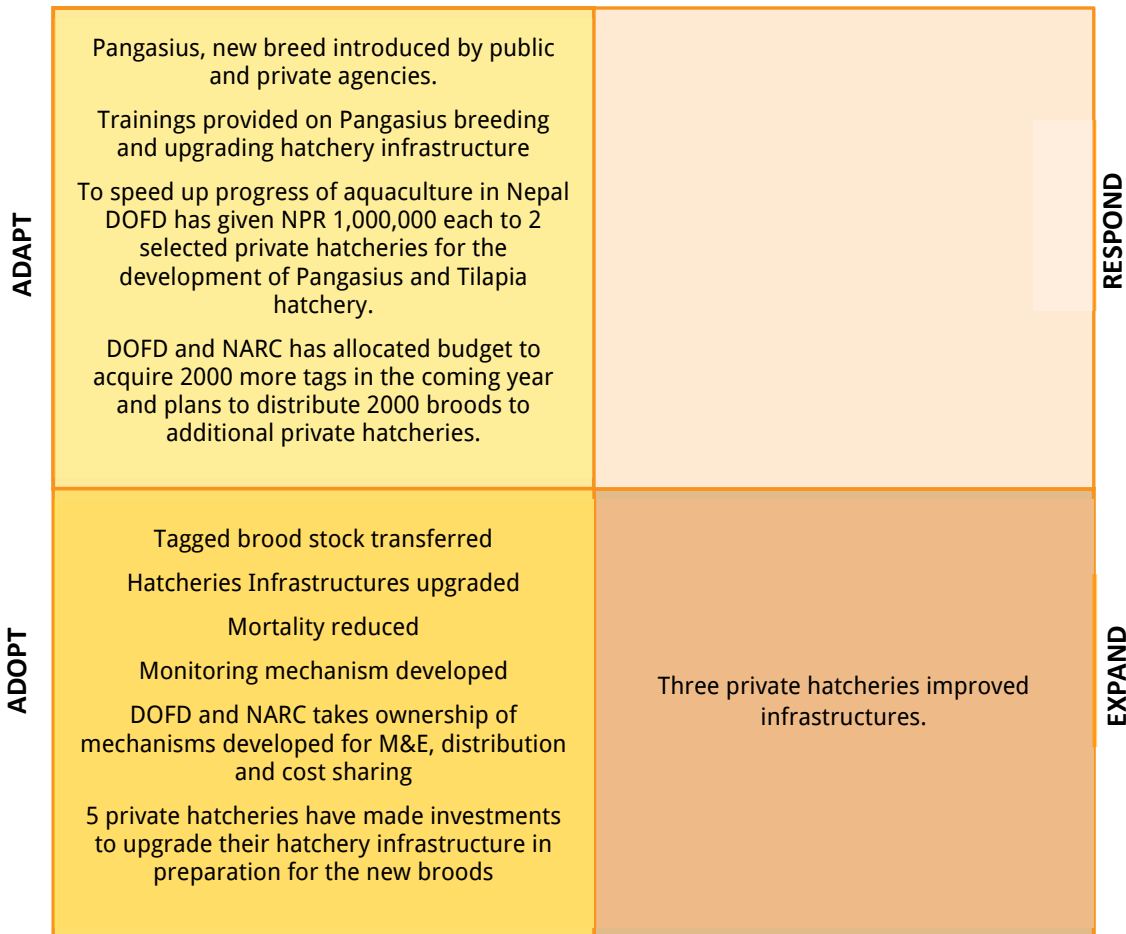


Figure 2: Measuring Systemic Changes

4. Lessons Learned and way forward

Both public and private actors play a significant role in the fish sector in Nepal. But, both have been working individually and the knowledge gained and the information on seed quality were very much centralised which limited the performance of all the actors in the fish value chain. It was necessary to bring all these actors together to function and work as a unit for the benefits of each other and increase the productivity through improvement in seed quality, pond and hatchery management, reduced mortality and feed access. The systemic changes in fish sector could be effective if these two players functioned in coordination with each other.

Samarth worked in accordance with the findings that public and private sectors need to work together in order to improve the quality of seed, that can in turn increase the productivity at the farmers' level. The increase in productivity benefits all the actors in the value chain in terms of economic change and sustainability. Samarth worked towards addressing the issue and brought the public and private actors together. The results reinforced its functionalities and potential to be sustainable.

A first step to bring both the parties together has been achieved, however, this needs to be continued. It is also necessary to segregate the role of public sectors and private sectors. Both the sectors should continue to support each other in order to enhance the performance of fish sectors and support the economic empowerment of fish farmers. If this continues, the fish sector will be able to sustain and supply adequate fish to Nepal market as per demand.