Fish Supply Chain

Design Report 2018

Government of Nepal
Ministry of Industry, Commerce & Supply
Rural Enterprises and Remittances Project (RERP)
'SAMRIDDHI'

Contents

I. Abbreviations and acronyms

CPMA : Corridor Potential Mapping and Assessment

FRC : Fish Research Centre

FDC : Fish Development Centre

FNCCI : Federation of Nepal Chamber of Commerce and Industries

GA : Government Agencies

IFAD : International Fund For Agriculture Development

MIC : Migration Information Center

MRC : Migration Resource Center

MAPs : Medicinal Aromatic Plants

MSP : Multi-Stakeholders Platform

MFIs : Micro Finance Institutions

RERP : Rural Enterprises and Remittances Project 'SAMRIDDHI'

RMSEs : Rural Micro and Small Entrepreneurs

SC : Supply Chain

II. Introduction Fish

The abundant availability of water resource is boon to Nepal and different fresh water habitat makes the Nepal potential for different fisheries and aquaculture activities. In the last 15 years, there has been an increase of more than 23000 mt of fish production in Nepal compared to that of the base year 1999/00 with 37427 mt production in the year 2013/14. The terai, especially the eastern terai is the main region for fish production however cold water species culture is developing in hilly districts. Although the fish production activities exhibited a very positive growth, overall productivity had not been satisfactory in terms of marketing management and its institutional capability. There is a long marketing channel and most serious marketing problems are lack of transportation, fish diseases, lack of financial facilities, fish theft, lack of research about fish marketing, unhygienic storing condition, lack of specialized fish marketing manpower and lack of adequate marketing infrastructure. Rohu, followed by Bachuwa (Pangasius), Naini, Catla and Magur are the fishes which are mostly consumed in Nepal. Fish consumption per capita in 2013 was 2.10 kg in Nepal. There are several fish and fishery product that are consumed by the consumer. In the market mostly live fishes, iced fishes, frozen fishes, dried fishes and canned fishes are consumed. Beside these fishes are also keep in aquarium for recreational purpose. Though the project area is potential for fish farming, the production and marketing system are still not satisfactory so we recommend RERP to address the problems faced by the farmers and traders to improve fish farming and market in Nepal.

III. Executive Summary

Rural Enterprise and Remittance Project (RERP) 'SAMRIDDHI' is an IFAD-funded project that aims at providing sustainable sources of income to poor households, migrant families and returnees in the eight districts of Province-1, Seven districts of Province-2 and One district of Province-3 of Nepal, by supporting the appropriate supply chain, creation and expansion of micro, small and medium rural enterprises both in the farming and off-farming sectors. Provide decent job opportunity to pro poor people through the vocational and apprenticeship training.

The project is a USD 68.2 million operation to be implemented on a 5-year period in 16 districts like Terhathum, Dhankutta, Bhojpur, Khotang, Okhaldhunga, Udaypur, Morang, Sunsari, Saptari, Siraha, Dhanusha, Mahottari, Sarlahi, Rauthat, Bara and Sindhuli. RERP-SAMRIDDHI's targets around 57,000 HH for Supply Chain, 13500 HH for enterprises and 30,000 unemployed youth which, taking into account job creation, should make a total of 94,500 primary beneficiaries and their households. Furthermore, the project will provide financial education in-country and abroad to improve the saving and investment capacity of included total 210,000 people in their households and 112000 persons will get safer migration counselling from 10 MRC and 4 MIC. RER/SAMRIDDHI will benefit of past and ongoing national experiences in the Rural Micro-Cottage and Small Enterprises (RMSEs) sector and will be implemented by the Ministry of Industry, Commerce and Supply, in partnership with the Agro Enterprise Center/Federation of Nepalese Chambers of Commerce and Industry (FNCCI), Helvetas, financial institutions extending services to the rural areas and other key partners. It will comprise four inter-linked components encompassing the full set of interventions required to support supply chain profitable and sustainable growth.

SAMRIDDHI has targeted to promote supply chain for 14 commodities in 6 different agriculture and non-agriculture sectors i) Vegetable: Off Season Vegetable, Potato and Onion, ii) Spices: Garlic, Turmeric and Ginger, iii) MAPs: Lemongrass, Citronella, Tulsi and Rose, iv) Livestock: Fish, Milk and Rabbit, v) Fruits: Lemon, Orange, Sweet Orange, Pineapple and Watermelon, vi) Other: Fish, Fine Rice and Floriculture. This report is concern with detail explanation of Fish supply chain promotion.

IV. Commodity /Supply Chain Description

Agriculture sector in Nepal accounts for more than one third of Nepal's GDP (35.1%) more than 3.6 percent of its export revenue, and 67 percent of jobs. In addition, the Nepal Labour Force Survey Report 2017 estimates that 73.3 percent of employed Nepalese work in the agricultural sector. Given the importance of the sector to the economy and people's livelihoods, the government of Nepal has made agriculture a key priority in the National Planning Commission Fourteenth Plan(2073-74 to 75-76 BS), in which it gives priority to increasing productivity, diversification and commercialization of agricultural sector. Fisheries have been successful in making theirs identity as

productive, dynamic and elevated sector compare with other two agriculture sector Crops and livestock. In the past ten years, the fishery sector has been maintained double digits growth rate so fishery business is an attractive profession of agriculture. It has proven growing agriculture sector in Nepal.

In terms of geographical condition, fishing is also good in Nepal, including hot environment and as well as cold air source. Some major carp species fish grow in warm environment in Nepal like Rahu, Naini, Bhakur, Grass-carp, Bighed-Carp, Silver Carp, Common-Carp and other Tilapia and Panghas are also grow under warm but Trout fish is grown mainly in cold water in Nepal. In Nepal 143733 population involve in fish farming and out of total one third are women.

Due to the health point of view, the fish market and consumer has increase but still fish market has not competed Fish. There are two types (traditional and intensive) of fish farming system in Nepal. In traditional farming system belief one time harvest within a year and produce large size of fish but Intensive farming system promote three times harvest within a year and produce commercial size of fish. So, if we improve productivity of fish then follow intensive farming system is in fish supply chain promotion.

V. Commodity Setting

Fisheries sector has been able to contribute 1.34% in national GDP and 4.29% in agriculture sector. The growth rate of whole agriculture sector is 2.22% but single growth rate of fisheries is 14.62%. Per person fish production status is 2.93 Kg and rate of fish availability is 3.33 kg, Lump sum 172352 Mt. fish is annually demanded in Nepal. Average national production is 83000 Mt., Commercial production is 62000 Mt., Per hec. national productivity is 4.92 Mt. and annual import status of fish is near about 11220 Mt.

District wise production status of fish is as follows;

Table-1 Fish production and employment status:

Districts	No of Ponds	Water Area (hec)	Production (Ton)	Productivity	Direct & Indirect Employment created	Forecast of Production (mt.)	Forecast of Marketable Surplus (mt)	Additional Job opportunity forecast
	Status of 2015/16					2021/22	2021/22	2020/21
Saptari	2684	991.8	4839.98	4.88	11220	5195	4156	814
Siraha	2154	807.44	3907.20	4.84	9058	3647	2917	784
Dhanusha	2353	963.17	4739.76	4.92	10988	5261	4472	801
Mahottari	1935	768.77	3792.34	4.93	8792	4096	3686	725
Sarlahi	1234	511.5	2652.89	5.19	6150	2892	2689	755
Rautahat	1171	517.09	2505.30	4.85	5808	2956	2720	636
Bara	4136	1243.24	6717.85	5.41	15573	7322	6956	875
Sindhuli	180	14.2	34.2	2.41	79	37	18	120
Total of JNK Corridor	15847	5817.21	29189.52	4.68	67668	31406.16	27614.91	5510
Morang	2912	583	2948	5.06	6834	3235	2587	582
Sunsari	1422	320	1591	4.97	3688	1750	1102.6	370
Udaypur	405	62.38	222.4	3.57	515	278	186.3	113
Khotang	60	3.6	5.4	1.50	13	9.86	8.78	0
Terhathum	10	0.2	0.3	1.50	14	0.32		0
Dhankuta	10	1.5	2.25	1.50	15	2.5	2.25	0
Bhojpur	10	0.5	0.75	1.50	12	0.83	0.75	0
Okhaldhunga	12	1	1.5	1.50	16	2.03	1.83	0
Total of KS Corridor	4841	972.18	4771.6	2.64	11107	5278.64	3889.43	1065
Total of RERP AREA	20688	6789.3	33961.13	3.66	78775	36684.8	31504.34	6575.00

(Source: CPMA-RERP, SINA-2074 and AMP of Purwanchal region 2017)
The RERP project implementation area has been contributing 55 % in national fish production. Fish is the one of most promising sector for investment as per its registered rate of annual production growth. Now live fish marketing system is continuously improving.

VI. RERP Setting

RERP had identified 64 promising fish cluster during CPMA 56 in Janakpur corridor and 8 in Koshi Sagarmatha corridor. After validation of fish multi stakeholder workshop it has increased and now no of highly potential cluster for fish supply chain are 75 under project covered area. Out of total 53 clusters in Jankapur corridor and 22 are in Koshi Sagarmatha corridor. Cluster by district are in Bara-6, Rautahat-5, Sarlahi-6, Mahottari-12, Dhanusha-7, Siraha-11, Saptari-6, Sunsari-5, Morang-10, Udyapur-1, Khotang-1, Okhaldhunga-3, Bhojpur-1 and Dhankuta-1. List of cluster with palika and district as below.

Table-2, Potential Fish Cluster of Janakpur Corridor

District	Palika	Cluster List	Lead Traders of Fish	
			Name	Cont. No.
Bara	Pheta Rural municipality	Feta	Binod Sah	
	Jitpur Simara SubMetro.	Jitpur Simara	Brij Sahani	
	Kolahabi municipality	Bodhban	Bidyalay Prasad	
	Kalaiya SubMetro.	Kalaiya	Garbhu Ji	
	Nijgadh Mun.	Nijgagh	Jang Bahadur Sah	
	Bisrampur Rural municipality	Bisrampur	Garbhu Ji	
			Manoj Patel	
Rautahat	Garuda Mun	Garuda	Shiv Dayal Sahani	
	Maulapur Mun.	Maulapur	Kishun Mahato	
	Gaur Mun.	Gaur	Naresh Sahani	
	madhab narayan mun	Khesarhiya	Bishnu Dayal Sahani	
	Debahigunahi Mun.	Debahigunahi	Gori Sahani	
Sarlahi	Barhathawa Mun	Murtiya	Suresh Sahani	9819661667
	Barhathawa Mun	Barhathawa	Shree Dayal	9845499828
			Jogendra Sahani	9844516916
	Kabilasi Mun	Kabilasi	Dhanipath Sahani -	9807831142
	Chandranagar Rural Mun.	Chandranagar	Dular Sahani -	9807817146
	Chakraghatta Rural Mun.	Jamuniya		
Mahottari	Samsi Rural mun.	Gaidavetpur	Nawan Sahani	
	Ekdara Rural Mun.	Ekdara		
	Ramgopalpur Mun.	Ramgopalpur	Govind Sahani	
	Loharpatti Mun.	Loharpatti	Rambilan Sahani	
	Jaleshwar Mun.	Jaleshwar	Rahul Mukhiya	
	Pipra Rural Mun.	Pipara	Prakash Mukhiya	
	Bhangaha Mun.	Hariharpur harimani	Ratan Mukhiya	
			Basaram Mukhiya	

	Loharpatti Mun.	Bhamarpura	Punit Sahani	
	Sonma Rural Mun.	Sonma	Imarhin	
	Balwa Mun.	Balwa Sarpallo	Sujit Sahani	
	Bardibas Mun.	Bijalpura	Ramkumar Sah	
			Dipesh Mukhiya	
	Matihani Mun.	Matihani	Ratneshwar Sahani	
Dhanusha	Kshireshwarnath Mun.	Mahendranagar	Balram Shreshtha	9815872086
			Lalan Mukhiya	
	Nagarain Mun.	Nagarain	Chande Mukhiya	
	Bateshwar Rural Mun.	Shantipur	laxmi sahani	
	Dhanushadham Mun.	Dhanushadham	Chuman Mukhiya	
			Shankar Mukhiya	
	Dhanauji Rural Mun.	Dhanauji	Ramchandra Sah	
	Janakpur SubMetro.	Janakpur	Pramod Sahani	
			Dharmdev Sahani	
	Mukhiya Musarniya Rural Mun.	Musarniya	Raghuni Mukhiya	
Siraha	Lahan Mun.	Lahan	Bindeshwar Sahani	
	Dhangadhimai Mun.	Fulkahakatti	Bijul Mukhiya	9808212930
			Satyanarayan Sahani	
	Sukhipur Mun.	Sukhipur	Devnarayan Sahani	9819944418
	Golbazar Mun.	Durgapur	Bijay Mukhiya	9819945323
	Ishwarpur Mun.	Bhaktipur		
	Siraha Mun.	Siraha	Mahendra Mukhiya	
	Karjanha Mun.	Karjanha	Chandeshwar Mukhiya	
	Arnama Rural Mun.	Arnama		
	Sakhuwankatti Rural Mun.	Sakhuwankatti		
	Mirchaiya Mun.	Mirchaiya	Bishnudev Mahato	9803561982
	Bisan Rural municipality	Bisanpur		
	Sukhipur Mun.	Sothiyani	Paltu Yadav	
Saptari	Dakneshwari mun.	Dakneshwari	Radheshyam Mandal	9805909092
			Bilat Chaudhary	9819797465
	Bisan Rural municipality	Bisanpur	Aanand Mukhiya	9819705840
	Shambhunath Mun.	Shambhunath	Satrudhan Mukhiya	9815789115
	Rupani Mun.	Rupani	Balram Yadav	9804788119
			Jageshwar Mukhiya	9805965473
	Rajgadh Rural Mun.	Rajgadh		

Table-3, Potential Fish Cluster of Koshi Corridor

District	Palika	Cluster of fish production	Buyers (traders) Name	Contact No.
Morang	Rangeli	Rangeli-1 Machha gaun, Kohigada, south part of Rajbanshi	Sambhu Sahani	9804062864
			Mahendra Mandal	9852028239
	Rangeli	Rangeli-2, Machha Pokhari, Rangeli -3,4,7,9	Ramchandra Baharda	9800974643
	Budiganga	Budiganga ward no. 1 to 7	Umesh Malaha	9810589442
	Pathari Sanicharey	Mahulibari, Hasandanda	Manoj Gautam	9842351832
	Gramthan Ga. Pa.	Simariya, Motipur, Tetariya, Katahara, Sidharaha, Banigaun, Varchol, Birta, Nadiyatok, Lakhantari	Shree Kishan	9805339953
	Dhanpalthan Ga. Pa.	Dadarbadiya	Ramesh Mukhiya	9815377438
	Sundar haraincha	Pacham, Mirgauliya	Raju Sahani	9842044632
	Belbari Na. Pa.	Matiyari, Dhanpal, Kakum, Dagiya, Bauni, Kaseni	Everest Machha Firm	9852022812
	Urlabari Na. Pa.	Rajghat, Ambadi	Guddu	9807063100
	Ratuwamai Na. Pa.	Itahara, Sijuwa, govindpur	Guddu	9807063100
Sunsari	Baraha Chhetra Na. Pa.	Madhuvan, Prakashpur	Sarwan Malaha	9818764369
	Koshi Ga. Pa.	Laukahi, Paschim Kusaha, Sripur, Haripur	Rupchan Mukhiya	9816361581
	Koshi Ga. Pa.		Chandu Mukhiya	9816393716
	Ramdhuni Na. Pa.	Ramdhuni-7, Baklauri, Jhumka	Mangala Mukhiya	9804012995
	Inaruwa Na. Pa.	Inaruwa	Suresh Mukhiya	9811349450
	Itahari Sub Metro Na. Pa.	Itahari, Tarahara	Suresh Mukhiya	9819021685
Udaypur	Triyuga Na. Pa.	Jajaley, Bulkiya, Rajabash	Satendra Sahani	9814733354
Khotang	Diktel Rupakot Majhuwa ghadi Na. Pa.	Nerpa, Dorpa	Lokendra Rai	9803701149
Dhankuta	Dhankuta Na. Pa.	Patle Khola	Suresh Sahani	9842070042
Okhaldhunga	Siddhicharan Na. Pa.	Ramailo Danda (11),	Ram kripal Mahato	9845834145
	Siddhicharan Na. Pa.	Bigutar		
	Siddhicharan Na. Pa.	Ramjatar		
Bhojpur	Bhojpur Na. Pa.	Pokharey (ward no-6)	Nepali Sena	021-420613

VII. First List of Fish Cluster

The first intervention list of cluster has prepared after MSP workshop with close consultation of traders and fish producers, field observation, volume of production, No of households involvement and road connectivity. RERP has selected potential cluster by follow market lead approach. Most clusters have highly connected with all-weather-road. Koshi corridor has selected 4 cluster for first in fish commodities, 2 cluster in Morang, 1/1 cluster in Sunsari and Udayapur as same Janakpur corridor has selected 6 cluster for first intervention. in Siraha-3 cluster, Dahnusha-2 cluster and in Bara one cluster has listed. The detail table of selected fish cluster are below;

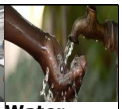
Table-4, Selected Fish Cluster for First intervention:

District	**Palika**	**Cluster**	Production (Ton)	No. of HH	**Trader**	**Contact No.**
Morang	Rangeli	Babiya Birta	150	30	Sambhu Sahani	9804062864
Morang	belbari	Kakum	20	35	Everest Machha firm	9852022812
Sunsari	Baraha	Madhuvan	525	230	Sarwan Malaha / bhisma Adhikari	9818764369
Udayapur	Triyuga MP	Jaljale, bhulkey	36	15	Satendra Sahani	9814733354
Bara	Kolhabi	Bodhban	50	170	Jang Bahadur Shah	9806837208
Dhanusha	Kshireshwor	Mahendranagar	150	60	Ram Kewal Mukhiya	9804816114

Dhanusha	Nagrain	Ghodghas,	700	200	Ram Pramod Raut	9844054046
Siraha	Dhangadhimai	Phulkahakatti	61	120	Arun Chaudhary	9807719922
Siraha	Karjanha	Karjanaha	45	100	Bishnudev Mahato,	9803561982
Siraha	Siraha	Siraha	70	120	Mahendra Mukhiya	

VIII. Economic Infrastructure

Among the selected 10 fish cluster road status is satisfactory level. We have found all-weather road infrastructure in 10 clusters. In details there are 7 clusters has connected with black topped road structure and 3 clusters connected with gravel road. Concern with power supply 2 clusters has been facing poor supply of power, 5 clusters has average electricity supply and in 3 clusters excellent supply of power. In average we have found satisfactory level of communication infrastructure in 10 clusters but Storage, Market and water facilities are very poor in all cluster level. So We need to focus RERP intervention in improvement of storage, market and water facility.

District	Palika	 Cluster	 Road Status	 Power	 Communication	 Storage	 Market Facility	 Water
Morang	Rangeli	Babiya Birta	Gravel + black topped	Excellent	Excellent	Traditional	Poor	Excellent
Morang	belbari	Kakum	Gravel + black topped	Good	Excellent	Traditional	Poor	Poor
Sunsari	Baraha	Madhuvan	Black Topped	Poor	Good	No	Poor	Good
Udayapur	Triyuga MP	Jaljale, bhulkey	Black Topped	Excellent	Excellent	No	Poor	Good
Bara	Kolhabi	Bodhban	Gravel	Poor	Good	Traditional	Poor	Good
Dhanusha	Kshireshwor	Mahendranagar	Black topped	Good	Excellent	No	Poor	Excellent
Dhanusha	Nagrain	Ghodghas, Gangooli	Black topped	Good	Good	No	Poor	Poor
Siraha	Dhangadhimai	Phulkahakatti	Gravel	Good	Good	No	Poor	Good
Siraha	Karjanha	Karjanaha	Black topped	Excellent	Excellent	No	Poor	Poor
Siraha	Siraha	Siraha	Black topped	Good	Excellent	No	Poor	Poor

IX. Supply Chain Mapping

Table-5, Supply Chain Actor – Function Matrix

Functions	Supply Chain Actors									
	Input Area				Production Area		Market Area			
	Feed Industries	Fish fingerlings transporter	Hatchery/ Nursery	Agro-vet & technology suppliers	Govt. Agencies	Farmers	Fisherman	Local Trader	Wholesaler	Processor-Wholesaler
Importing										
Exporting										
Processing										
Wholesale										
Trading										
Production										
Input supply										

Supply Chain Map The SC map based on the actor – function matrix (Fig.)

Table-6, Supply Chain Actors / stakeholders

Stakeholder / actor type	Description	Location
Wholesaler	➢ Fish collect form local traders and	▪ Rambabu Yadav, Ga.Char. N.Pa,

/Processor	sale to retailor out of district. ➢ Import fish form India	Dhanusha ▪ Ajay Kumar Sah, Birgunj, Parsha ▪ Bishnudev Mahato, Mirchaiya, Siraha ▪ Mohan Rai-Everest Fish Firm, Morang
Wholesaler	➢ Fish collect form local traders and sale to retailor out of district. ➢ Live fish trade	▪ Dhanusha-3, Sindhuli-1, Parsha-2, Siraha-1, Bara-4, (one of large wholesaler Garbhu Sah-Birgunj, Parsha) ▪ Biratnagar-2, Dharan-2
Local Traders	➢ Collect fish form ponds or fishermen and sale to market. ➢ Sale to wholesaler ➢ Export fish in nearest market of India	▪ Dhanusha-10, Saptari-5, Siraha-8, Mahottari-13, Rautahat-5, Sarlahi-2, Bara-7, Sindhuli-1 ▪ Morang-9, Sunsari-6, Dhankuta-1, Udayapur-1, Khotang-1, Okhaldhunga-1
Fishermen	➢ Basically fishermen provide service in harvesting of fish to farmers. ➢ Majority of fishermen involve in fish trading and plying role of local traders. ➢ Few fishermen are involved in exporting fish to nearest market of India specially who live near the Indo-Nepal border.	▪ Fishermenship is traditional profession of Bin/Malaha and Majhi community. ▪ High density of presence in province-2. ▪ (Need to Identify no of fishermen by cluster and districts) (Estimated no of fishermen per cluster 15-25)
Farmer	➢ Majority of farmers have been producing fish but few farmers are involving in trading too.	▪ In total 78775 person's job created in fish sector of RERP area. Out of total JNK corridor 67668 and KS corridor 11107 ▪ There are 6575 persons additional job opportunity in project area ▪ 1080 person's additional job opportunities in first listed 10 clusters.
Government Agencies	➢ GA producing quality of fingerlings and sales to farmers. Recommendations of improved breed. ➢ Provide Lab facility, technical services, capacity development training to farmers and conduct research for quality improvement of farming technologies. ➢ Demonstration at cluster level.	▪ Fish research centre Tarahara, Sunsari. ▪ Fish research centre Parwanipur, Bara ▪ Fish development centre Fatepur, Saptari ▪ Fish development centre Lahan, Siraha ▪ Fish development centre Janakpur, Dhanusha
Hatchery/ Nursery	➢ Hatchery producer fingerlings and supply to direct farmers. ➢ Provide few supports in capacity development of fingerlings receiver farmers. ➢ All private hatcheries are involved in fish production and trading too.	▪ There are 3 hatcheries and 5 nurseries have been functioning in Morang districts. ▪ In province-2, 55 hatcheries and 40 nurseries are functioning in Rautahat, Bara, Sarlahi, Mahottari, Dhanusha, Siraha & Saptari.
Fish fingerlings transporter	➢ They supply fingerlings to farmers with close coordination of hatchery or nursery ➢ Fish fingerlings transporters provide counselling about farming and also share market information to producers.	▪ 3-4 persons in each hatchery centre of Dhanusha. ▪ At list 1-2 Fish Fingerlings Transporter are evolving each hatchery of other district.

Feed Industries	➢ They produce feed for fish and distribute it to farmer through agro-vets, ➢ Demonstrate fish farming in cluster level	▪ Manakaman feeds Biratnagar, Sakti Feed Birgunj and IMADC Tikathali Lalitpur ▪ Nimbus has demonstrated fish farming at parwanipur.
Technology Suppliers	➢ They supply net, packaging carets, Lab equipment's and fish farming & trading related other tools to producers and traders	▪ We have found only 4 suppliers under project area Birtnagar, Lahan, Janakpur and Birgunj
Agro-vet	➢ Agro-vets have been supplying to farmers several inputs like feed, Urea, D.A.P & Lime ➢ They also compacted to producer on uses of inputs	▪ Poor presence of agro-vets in cluster level. some where we found producer cooperatives are involving in this services but sufficient no. of agro-vets available in district headquarter and big market area. (7)

X. Supply chain functions;

The functions performed by the actors in the Supply chain. One function maybe performed by more than one actor, and each actor may perform more than one function.

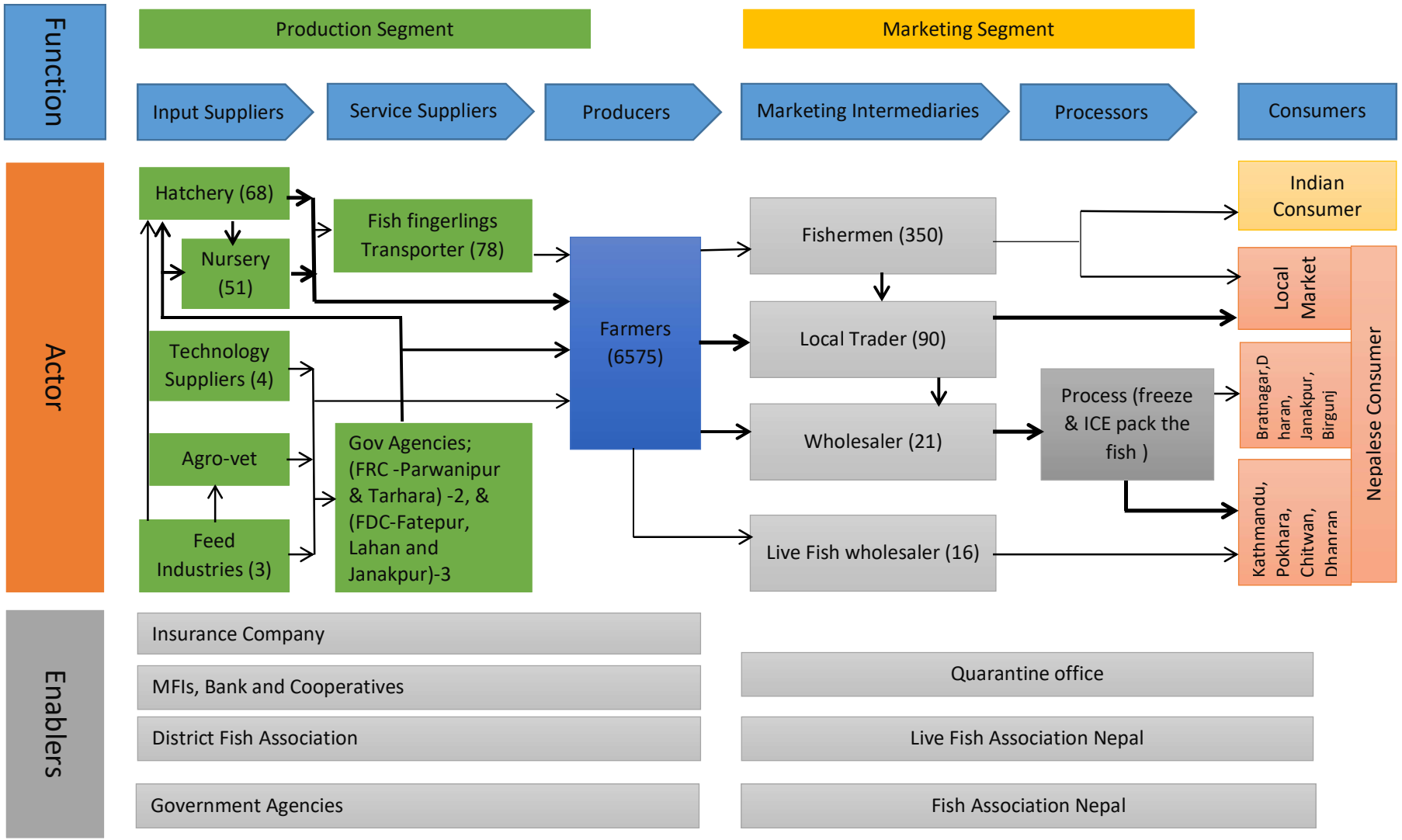
Table-7 Supply chain functions

Supply chain functions	**Description**
Consumers	Consumers are mostly individual households located in urban and rural areas, the fast-food shop, restaurants and hotels, and Army-polish camps. Consumers concerns relate to hygiene and sanitation of fish retailer's shops, Most of the consumers preferred fresh and live fish in urban area and also interested to buy local fish, Janakpur fish, Koshi fish and several lake fish are famous in Nepal.
Retailing	Retailers represent the final link that connects producers to consumers in the market chain. Retailers are mostly Malaha and fish seller who process fish and sell directly to the consumers, restaurants, hotels in the big cities and market. There are almost (Need to find) fish shops in the Project area, out of total ….. in JNK corridor and ….. in KS Corridor. Fish shops (retailors) directly buy fish from farmers or Local traders or wholesaler and supply as per the local Fish demand.

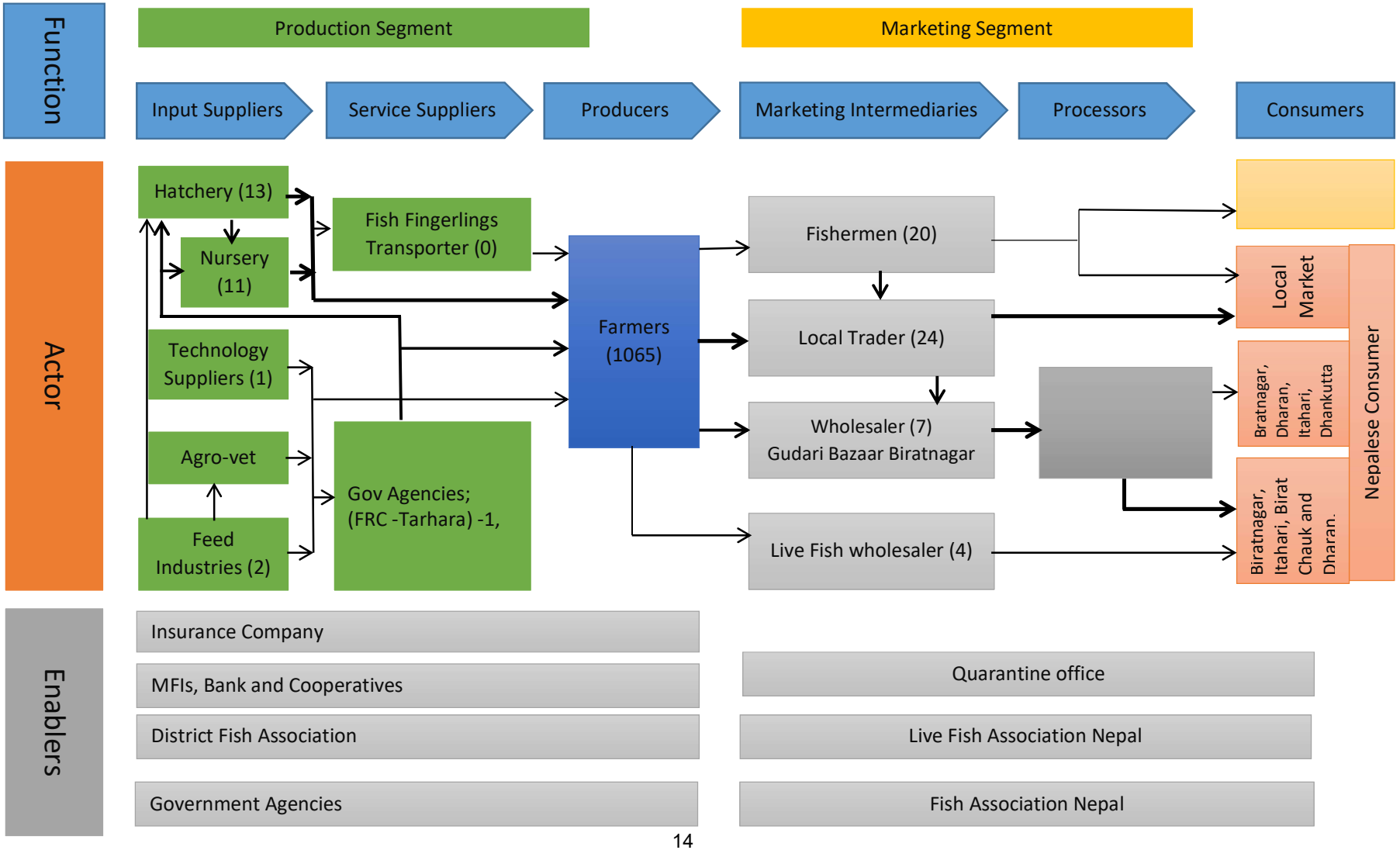
Importing	Fish imports are mostly done by wholesaler and mostly from southern part of Nepal, for sale in major cities of Nepal. We have identified only 4 traders to till who involved in the import Fish for nepal. The vertical supply chain of fish import from India is well-established and efficient. These wholesalers have focused to major cities of Nepal like Kathmandu, Chitwan and Pokhara, They import freeze fish form Andra Pradesh Indian but few informal import trade of fish in border area without any hindrance due to porous border line. Mostly local Indian traders are involved for that. The private sector import trade is running as a formal sector and has no hindrance from any agencies. Less Informal trade of fish in Nepal although porous border with India but we need to advance level of quarantine for import hygienic fish from India.
Processing	Only Imported fish should be process by privet sector. As per field observation we have found only 2 processing centre one in Mirchaiya, Siraha and other is in Birgunj. Only freezing and packaging should be done in processing centre. There is need to improvement fish processing centre in project area.
Exporting	Fish exporting by local Nepalese local traders and fishermen. Mostly fish export to India informally form remote border area of Sunsari, Saptari, Siraha, Dhanusha, Mahottari, Saralahi, Rautahat and Bara.
Trading (Local, Regional, National)	Various level of traders in fish marketing exist at district, regional and national level and they often operate in close coordination, sometimes sharing risks and profits. There is, however, a clear division of work between purchasing at the district and regional level and selling at the end market. The number of fish traders is directly related to the quantity of supply and demand. Five types of traders have been identified: I. Traders who collect fish from the farmers and themselves do the further selling by taking the fish to nearby markets and export to border area market in India. II. Traders who collect fish from farmers, transport and supply to the big market along the road-corridors; local fish trader and markets such as district headquarters of project districts and other main markets. III. Those who collect **only live fish** from direct to farmers and send to the distant markets Chitwan, Butwal, Dharan, Pokhara and Kathmandu as quickly as possible with own transporting system and supply their agents in the destination. IV. Those who collect fish form farmers and district market and send to the distant markets Chitwan, Pokhara, Kathmandu as quickly as possible with own transporting system and supply their agents in the destination to deal with the further selling activities. V. Traders who only **import fish from Indian** market and process it in theirs collection centre and send to the distant markets Chitwan, Pokhara, Kathmandu through own transporting system and supply their agents in the destination to deal with the further selling activities. Some of the issues pertaining to the trading of fish includes: Traditional waiting system is still in practice. Need to farm gate selling price fixing according size of fish. Certification of imported fish from quarantine office. Reduce police harassment during transportation. Improvement of Live fish transportation and storage facility, General fish transportation and storage facility, All these issues have set back the domestic fish SC development. Project interventions should facilitate building trust among actors.

Collection	Mostly fish collected by live fish traders and fish importer only in systematic way. Fishermen, local trader and wholesaler collect fish traditional. They collect fish in large pot and pack it for little times. Fish retailers collect fish in ice bag and store it in nearby the end markets. Live Fish traders and Importers are little bit professional and have many years of experience in the fish trading business. If we want to promote well SC of fish then our intervention should focus in advance fish collection centre development in certain distance with project working area.
Production	Production is mostly done by farmers, both individually and registered firms. Farmers lack adequate technical knowledge and are rarely commercially oriented. Well established technologies and practices for increasing production and productivity are however available. An emerging trend is for large private farms to be involved in fish production. we need to address improvement of pond engineering, Nursery management, water management, feed management, fish collection centre and reduce Bhura loss for promotion of fish production.
Input supply	Fish feed, quality breeds (Bhura), knowledge about pond engineering, fishing tools, intensive fish farming knowledge are key inputs. In addition, inputs required by the producers are to know how diseases of fish. Need to improve Lab facility of Fish development centre, Capacity development of hatchery and nursery for quality of Bhura production, Improvement of Bhura transportation system for SC promotion of Fish.

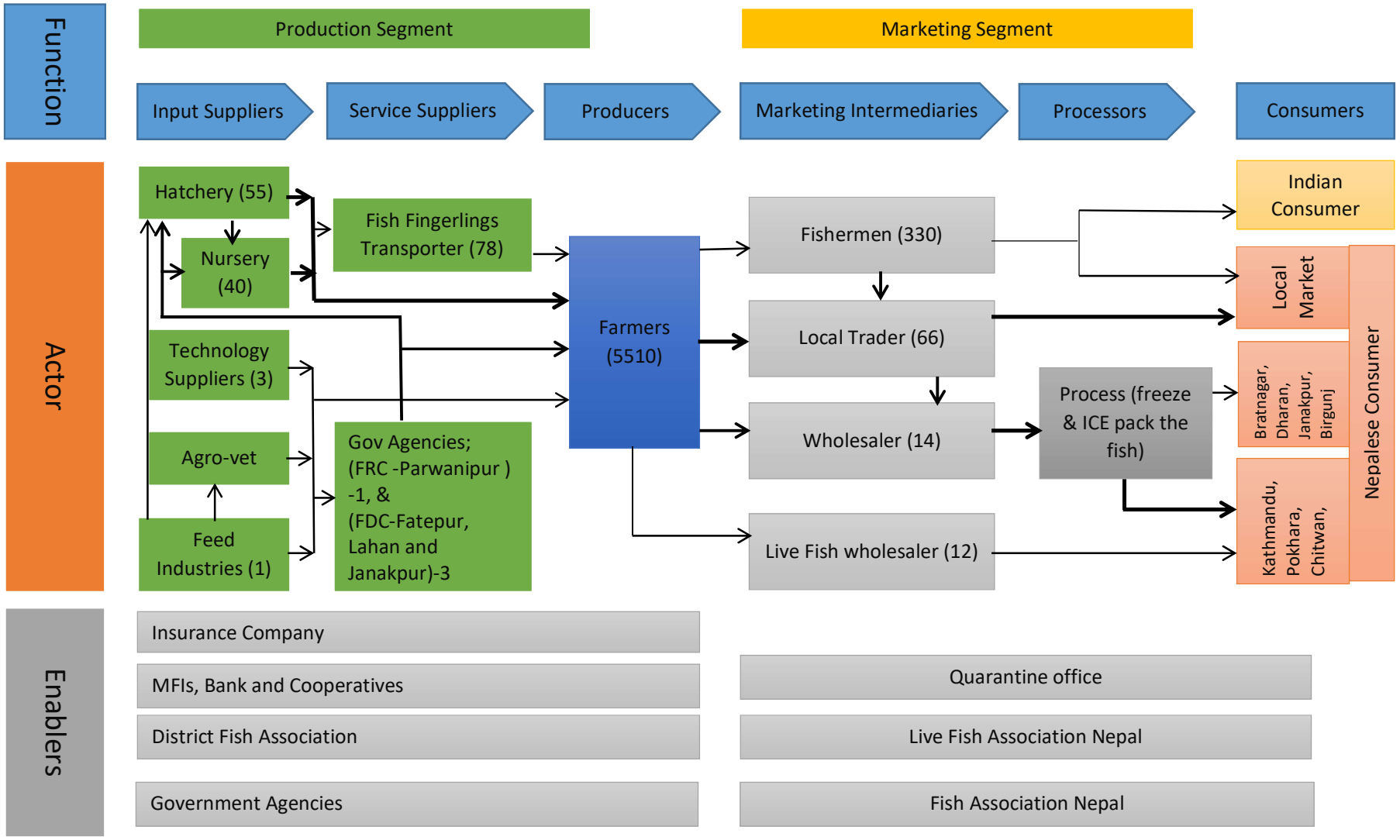
XI. Basic /Detail Fish Supply Chain Map of RERP



XII. Basic /Detail Fish Supply Chain Map of KS Corridor



XIII. Basic /Detail Fish Supply Chain Map of JNK Corridor



XIV. Analysis of Opportunities and Constraints

The SC analysis describes the current situation, opportunities / constraints and recommendations for improvements across the key structural and dynamic elements.

Constraints	Effects in Supply Chain	Potential intervention	Potential opportunities
I. Service Segments			
Lack of modern Lab for soil test and identifying fish diseases.	➢ In absence of advance LAB farmers are unable to develop proper production plan and fight with fish disease.	➢ Capacity development of FRC. ➢ Improve Lab facility at list corridor level	➢ Improved LAB facility should reduce fish disease, recover soil capacity and support in increase productivities at farm level
Lack of special feed & quality of diet for fish	➢ Unavailability of special feed heat directly in reduce productivity and minimise harvest cycle at farm level.	➢ Promote B2B linkage between farmers and feed suppliers. ➢ Conduct cluster level demonstration event and improve trustful environment between producers and feed company.	➢ Feed facility should improve productivity of fish and promote maximum harvesting cycle at farm level.
High rate of fingerlings loss during transportation	➢ 15 % to 30 % fingerlings loss during transportation. ➢ Under waited & grade less fingerlings supply. ➢ Less fish production then estimate	➢ Live Bhura transportation van is require to hatcheries ➢ Modern technologies require for weighting Bhura. ➢ Need to develop fingerlings grading mechanism at farm	➢ Reduce fingerlings loss during transportation. ➢ The producers receives amount of fish according to they purchased. ➢ Improve production and reduce cost of production too.
Insufficient fishermen have at cluster level	➢ Producers have unable to harvest fish on time ➢ It has been create problems in intensive fish farming.	➢ Capacity development about fishing and increase human resource at cluster.	➢ Intensive fish farming promotion. ➢ Increase income level of fish farmers.
II. Production Segments			
Lack of proper business planning and costing practice within fish actors	➢ The fish producers have sale fish without costing. ➢ They have no any tangible idea about costing and pricing theirs product.	➢ Cluster level business planning. ➢ Costing to each and every actors level. ➢ Improve fair market pricing system within the chain	➢ Actual pricing should improve producer level income and reduce unnecessary price increment at end market

Insufficient capacity on pond engineering and it's management.	➢ production of fish is under capacity and still less productivity due to lack of pond engineering	➢ Capacity development training to local persons about pond engineering.	➢ Improve production and increase productivity.
Inadequate infrastructure for fish farming	➢ Insufficient water & electricity supply reduce production at farm level. ➢ Increase cost of production too	➢ Facilitation in Improvement of water facility at cluster. ➢ Promote appropriate tools and technology for farm improvement.	➢ Improve production and support in reduce production cost and increase income level of producers.
Poor horizontal linkage	➢ No any producer cooperatives and group of fish producer has found active. ➢ cluster level service is highly expensive and scatter too ➢ each and every fish actors doing business alone	➢ Facilitation in activation of producer group and cooperatives	➢ Improvement of bargaining power, ➢ decrease capacity development cost ➢ Improve common understanding.
No market assurance to fish producer	➢ Producers are not getting actual price form buyers. ➢ Uncertainty of market and sale of fish	➢ Facilitation in promotion of buyers and producers relations. ➢ B2B linkage, contractual business system promotion.	➢ Farmers get reasonable price from traders. ➢ Improve income to farmers. ➢ Improve supply chain at root level.
III. Market Segments			
Lack of storage facility for live and other fish.	➢ Consumers have been getting treated fish in market rather than fresh fish. ➢ No trustful environment between traders and consumers.	➢ Facilitation in improvement of fish storage at market level for both live and other fish.	➢ Increase availability of hygienic table fish in market. ➢ Increase market of fish ➢ Improve trust with consumer. ➢ Increase income of traders.
Lack of modern transportation equipment to transport live and other fish.	➢ Fish loss during traditional transporting. ➢ Cost of price increase at consumer level	➢ Facilitation in improvement of fish transportation system.	➢ Live fish available at consumer. ➢ Consumer get fish in reasonable price. ➢ Sale increase and improve income.
Lack of hygienic, clean and modern retail market place	➢ Unhygienic fish market and unmanaged fish retail	➢ Improve fish retail market	➢ Increase consumer and volume of

	shop. ➢ Civilized consumer are not interested to retailing fish	infrastructure. ➢ Promote standard fish storage at retail market.	sales. ➢ Increase fish market and income of retailors too.
Poor vertical linkage	➢ Most of SC actors doing business alone. ➢ Collection and transportation cost are high, ➢ High price flexibility in fish sector due to weak vertical linkage.	➢ Facilitate to B2B linkage and legal business. ➢ B2B workshop facilitation. ➢ promote collective effort	➢ improve legal market and promote sustainable SC. ➢ Reduce collection and transportation cost as well as stability of price
IV. Enabling Environment segments			
Traditional quarantine check post	➢ Highly treated and unhealthy fish import in Nepal market	➢ Facilitation in capacity enhancement of quarantine check post within project area.	➢ Reduce unhealthy fish form retail market. ➢ Protect consumer health and promote local fish market
Unnecessary fee collection & torcher by security person on the way of transportation	➢ Obstacles in fish transport business. ➢ Increase retail cost of fish	➢ Improve capacity of fish associations. ➢ Activate task force team in sector.	➢ Should be reduce collection of unnecessary fee and torcher by road security.
Inadequate access on loan & insurance	➢ Few farmers have practiced fish insurance. ➢ Problems in large investment. ➢ Smallholder farmer facing financial crisis.	➢ Mobilization of insurance company. ➢ Mobilization of MFIs, Bank and cooperatives	➢ Improved financial access of fish actors should support to actors to increase investment and promote job opportunity within the sector.
Poor coordination among fish market actors and unfair business environment too.	➢ Unmanaged fish market in project area. ➢ Market price deviation. ➢ Les trustable market	➢ Facilitation of MSP at corridor and cluster level. ➢ B2B linkage promotion. ➢ Contract base market and supply chain promotion. ➢ Common intervention plan development. ➢ Strengthening of fish association.	➢ Improver overall performance of fish sector. ➢ Improve production of fish ➢ Improve fish supply chain. ➢ Increase income level of fish actors.

XV. Intervention Plan for Fish Supply Chain

SN	Key Interventions for Fish Supply Chain	SAMRIDDHI FUND			SD Facility		Other Source	Investment Responsibility
		W1	W2	W3	W1	W2		
1	Facilitation in water facility improvement at cluster level.							Farmer + RERP
2	Demonstration of appropriate tools and technology at cluster level.							Input suppliers + Farmer + RERP
3	Bhura weighting and grading tools or equipment's							Input suppliers + Farmer + RERP
4	Hatcheries and nursery improvement							Privet + RERP
5	Bhura transportation van to hatcheries							Hatcheries + RERP
6	Facilitation in improvement of live fish transportation							Local & Big trders + RERP
7	Facilitation in improvement of fish storage at market level for both live and other fish.							Big Traders + RERP
8	Improve Lab facility to FRC at list corridor level							FRC + RERP
9	Facilitation in capacity enhancement of quarantine check post within project area.							Quarantine + RERP
10	Demonstration live fish retail market infrastructure with appropriate storage facility.							Local Level + Fish Retailors + RERP
11	Fishermenship training at cluster.							RERP
12	Costing and business planning to SC actors							RERP
13	Pond engineering training							RERP
14	Cluster level production demonstration							Feed Company

XVI. Value Added Analysis

The distribution and magnitude of the Supply added along the Supply chain

Simplified Value Added Distribution [EXAMPLE – REPLACE]

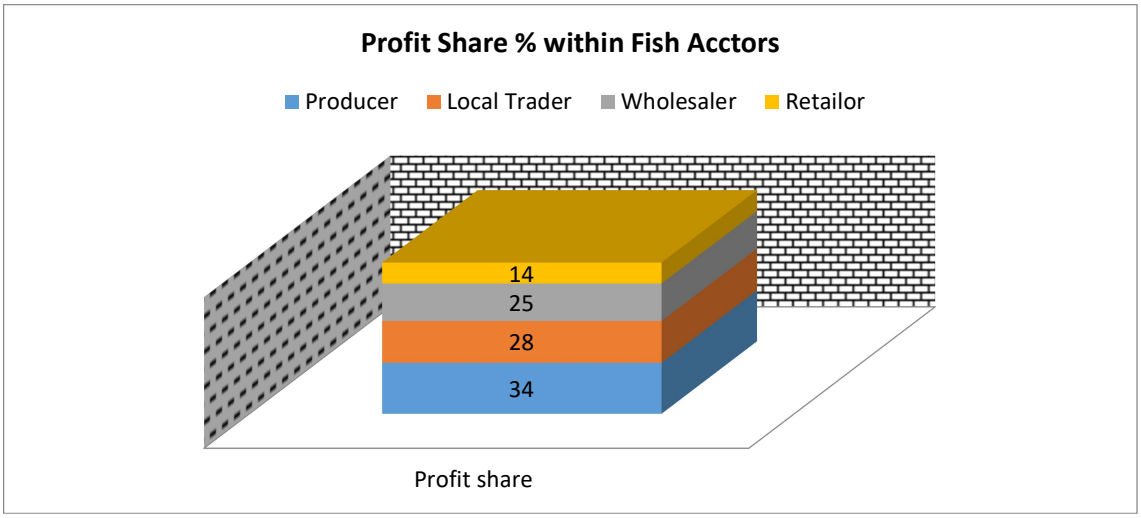
Elements	**Supply Chain Actors / NRS‘ per**			
	Producers	**Trader**	**Wholesaler**	**Retailor (NM)**
Intermediate goods	4050 Squire Fit water land			
Inputs	123700	250000	302500	450000
Labour	6666	12000	18000	
Transport	-	20000	30000	
Other	1328	12000	18000	10000
Processing	0	0	10000	0
Total inputs [A]	131694	294000	378500	460000
Total Production in kg	1000	1000	1000	1000

Cost of Production @ kg	132	294	378.5	460
Sales @ per kg [B]	230	375	450	500
Total Sales	230000	375000	450000	500000
Value Added @ kg	118	64	30	30
Net revenue	98306	81000	71500	40000

The findings of the Value added analysis as presented graphically in

Figure 1. The figure indicates…..

Figure 1 Net Revenue Distribution in sales



XVII. Supply Chain Governance

Current situation The relationships between the various actors in the Supply chain and the key operation parameters that define the governance arrangements.

[Add further explanation here….]

Supply Chain Governance Mapping

Key parameters	Producers	Trader	Processor	Wholesaler	Sector
Who chooses **what** is to be produced?					
Who chooses **how** it is to be produced in terms of:					
• The technology?					
• The quality systems?					
• The environmental standards?					
Who determines how **much** and **when** to produce?					

Thank you