

***Issue - 12, Vol-06, pp. 01-09, Jul-Dec 2016***

***CLEAR International Journal of Research in Management, Science and Technology***

**RESEARCH ARTICLE**

**A CASE FOR VALUE ADDITION AND VALUE CHAIN MANAGEMENT THROUGH  
FISHERIES COOPERATIVES IN PUDUCHERRY UNION TERRITORY**

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**ABSTRACT**

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***Article History:***

Received 22nd April 2016  
Received in revised form 1st  
May 2016  
Accepted 05.05.2016  
Published on 01.05.2016

***Keywords:*** supply chain  
management- preservation-  
value addition- VCM practices

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Value addition is an expanding sector in the food processing industry. Value addition to fish and fishery products could be done depending on the requirement of different markets. So cooperatives can help develop a sustainable value addition infrastructure for the betterment of the entire fisheries sector in all the states including Union Territories. This article is an attempt to study the options and prospects of value addition in the fisheries sector of Puducherry Union Territory. Puducherry UT is capable of updating its fisheries technology with its committed and dedicated population of fishermen. The cooperative sector has to extend a helping hand for the overall growth and further string thinking of fisheries sector, especially by improved VCM practices as suggested above. It is for the policy makers to allocate budget funds and help create a world – class system of supplying quality stocks to the ultimate consumers living in interior parts of the country.

## Introduction

The cooperative sector in India is in a position now, where in every unit of it requires further strengthening mainly from the view point of their strategic approach in the delivery of their specialized services to the community at large. For the overall development of cooperative institutions, it is all the more important for them to plan their future strategically and step into actions of competence so as to effectively pose a challenge to competitors of any sort.<sup>1</sup>

Cooperatives represent a model of economic enterprise, which effectively implement, promote democratic and human value as well as respect for the environment. It is compelling to consider cooperatives as another model of economic enterprise, amongst the diversity of available business forms that promote community self-reliance and benefit the society at large. Cooperatives create, improve and protect income as well as generate employment opportunities and contribute to poverty reduction.<sup>2</sup>

The fisheries cooperatives in Puducherry and Karaikal region need such a push for their further growth. This article aims at such a push through value addition in their day to day activities. Value addition is the any additional activity that in one way or the other change the nature of a product thus adding to its value at the time of sale. Value addition is an expanding sector in the food processing industry. Value addition to fish and fishery products could be done depending on the requirement of different markets.

The value addition can be done to any fish in fresh form, and as well in frozen, dried fish, salted fish, smoked fish, canned fish, fish oil, fish meal and others. The process of value addition with respect to reduction of fish for fish meal is questionable in term of quality and impurities. As the fishes are dried in the open beaches a lot of impurities gets into the raw material (fish) which affect the quality. As a result most of the fish meal produced within the country is unfit for use feed. The quality of fish and that of other fish products depend on safe and hygienic practices at various levels. Fish borne illness can be reduced if appropriate practices are followed while handling, refrigerating and transporting fish and fish products. Ensuring standards of quality and safety will minimize the post harvest losses and it

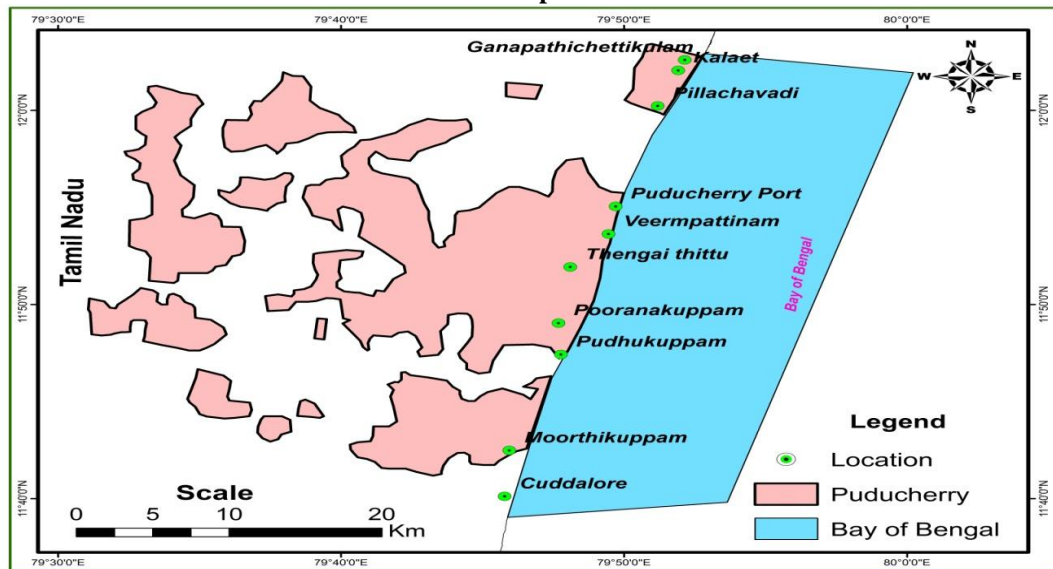
would ensure that the fish handling, processing and transportation with requisite standards.<sup>3</sup>

Value addition in fisheries sector is a major thrust area of any state government in India. One of the supporting institutions to bring about such a value addition in their respective fisheries sector is the active presence of cooperative societies who engaged themselves in the upliftment of poor fishermen. So cooperatives can help develop a sustainable value addition infrastructure for the betterment of the entire fisheries sector in all the states including Union Territories. This article is an attempt to study the options and prospects of value addition in the fisheries sector of Puducherry Union Territory. The Puducherry Union Territory comprises of four regions viz., Puducherry, Karaikal, Mahe and Yanam and it has a total coastal line of 45Kms, as well as 1,000 Sq. Km of continental shelf enriched with marine fisheries potential. It has a fishermen population of 75,965 of which 20,000 nos. of fishermen families are actively engaged in 27 marine fishing villages and 23 inland fishing villages/hamlets scattered in and around the Puducherry Union Territory.<sup>4</sup> Please see the Maps.

Fishery in India is an important part of our economy. There are a little over 10 thousand functional primary fisheries cooperative societies having a membership of around 3 lakh fisherman in the country, who are socially, economically and educationally backward. Please see Table 1. They need skills up-gradation to enable themselves to use at least medium technology in the field of fisheries and also need education for their managers/members of fishermen cooperatives to run their societies smoothly in a viable way. It has been observed that there are many unidentified and unorganized fishers in the country who are deprived of the benefits and various schemes sanctioned by the Government of India as well as by the state Government in Puducherry.<sup>5</sup> In spite of the shortcomings, the state of Puducherry is able to be at VIII Rank amongst the coastal states. Even Gujarat falls only next to Puducherry. Similarly the fish production is shown in the Table 2. According to the table, there is a mixed trend in the total fish production in the state under study. So also in the growth rate. However there is a sort of stability in total production from 2006-07 to 2011-12. Similarly, Table – 3 shows the total prawn production in Puducherry.

**Processing and Preservation for Value Addition in Puducherry Union Territory**

**Map 1**



**Map 2**

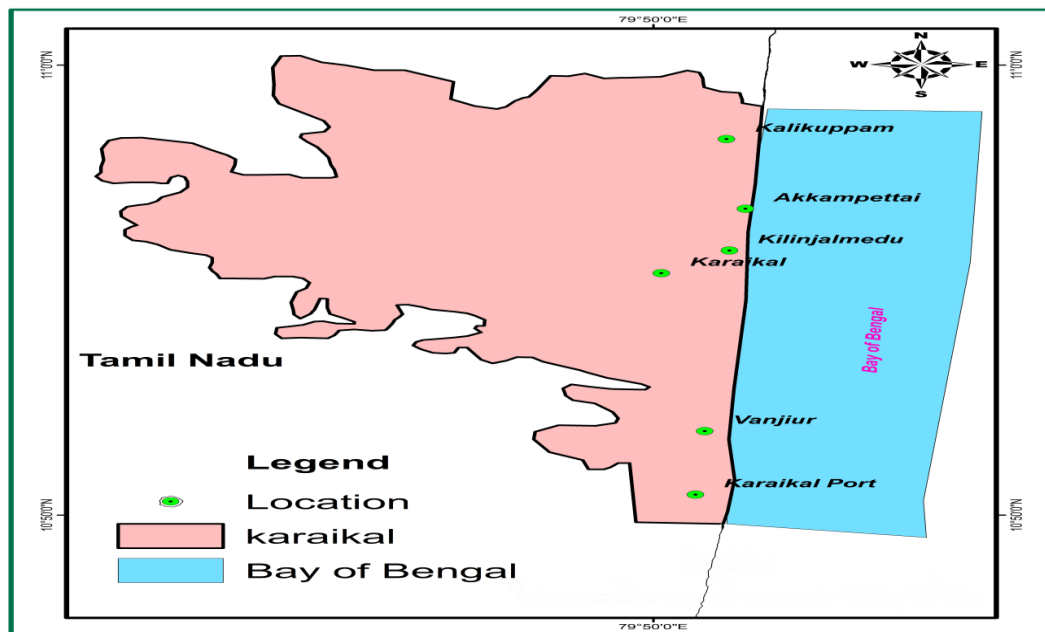


TABLE 1

## Primary Fisheries Cooperative Societies (Marine) in India

Sl. No.	Name of the States/Union Territory	No. of Societies				No. of Members	Total Fisheries Population	Membership Based Ranking *
		State Level	Regional Level	District Level	Primary Level			
1.	Andhra Pradesh	1	-	13	2,275	2,52,174	8,93,365	IV
2.	Goa	1	-	-	20	1,503	13,970	XII
3.	Gujarat	1	-	2	263	26,045	4,93,255	IX
4.	Karnataka	1	-	2	420	2,04,689	3,36,927	V
5.	Kerala	1	-	-	386	3,48,636	7,47,837	II
6.	Maharashtra	2	1	39	3,315	3,32,636	4,67,387	III
7.	Odisha	1	-	2	475	91,266	1,80,026	VII
8.	Tamil Nadu(TN)	1	-	11	1,353	6,01,620	8,61,000	I
9.	West Bengal	1	-	20	1,433	92,759	9,11,622	VI
10.	Andaman & Nicobar Islands	1	-	-	14	1,361	17,552	XIII
11.	Daman & Diu	-	-	-	7	3,136	25,485	X
12.	Lakshadweep	-	-	-	6	2,910	13,029	XI
13.	Puducherry	1	-	1	64	58,522	75,965	VIII
Grand Total		12	1	91	10,031	20,17,552	50,37,420	-

Source: <http://www.Data-Bank,Nation-Wide-Survey-on-Database-Fisheries-Cooperatives>, (Visited on 16.02.2017). p-2. \* Computed by the Research Scholar.

TABLE 2

**Fish Production in Puducherry Union Territory during  
From 2004 - 05 to 2012 – 13**

Sl. No	Year	Inland Fish Production		Marine Fish Production		Total Fish Production	
		Inland ('000 Tonnes)	Growth Rate (%)	Marine ('000 Tonnes)	Growth Rate (%)	Total Production ('000 Tonnes)	Growth Rate (%)
1.	2004 – 05	5.25	0.96	31.50	-26.40	36.75	-23.44
2.	2005 - 06	2.18	-54.48	19.27	-38.83	21.45	-41.63
3.	2006 – 07	6.06	177.98	33.61	74.42	39.67	84.99
4.	2007 – 08	5.57	-8.09	33.44	-0.51	39.01	-1.66
5.	2008 – 09	5.75	3.23	34.55	3.32	40.30	3.31
6.	2009 – 10	5.85	1.74	36.10	4.49	41.95	4.04
7.	2010 – 11	5.85	0.00	36.10	0	41.95	0.00
8.	2011 – 12	4.79	-18.12	37.61	4.18	42.40	1.07
9.	2012–13	5.46	1.54	35.61	-2.10	41.07	0.96

Source: <http://www.Fisheries Profile of the Union Territory of Puducherry>, (Visited on 6.10.2015). p-2

TABLE 3

**Prawn Production and Sales Volume in Puducherry  
During 2004 - 05 to 2013 – 14**

Sl. No	During the Year 2004-05 to 2013 -14	Prawn/Shrimp Production (Tonnes)	Total Sales Volume (□ Cr.) (Estimated)
1.	2004 – 05	3,783(×160)	60.52
2.	2005 – 06	1,656(×200)	33.00
3	2006 – 07	334(×240)	8.01
4.	2007 – 08	2,283(×280)	63.92
5.	2008 – 09	2,226(×320)	71.23
6.	2009 – 10	2,460(×380)	93.48
7.	2010 – 11	1,485(×430)	63.85
8.	2011 – 12	2,759(×480)	132.43
9.	2012 – 13	2,671(×520)	138.89
10.	2013 – 14	2,991(×550)	164.55

**Source:** <http://www.Indiaenvironmentportal.org.in/File/File/Handbook%20on%20fisheries%20statistics%202014.pdf>, p 74, Visited on 2-3-2017. Figures in Brackets are the Current Market Value of per kilo of Prawn.

According to the table, except for 2010-11, there is a steady increase in both physical and sales volumes of prawn production in Puducherry which leaves behind a promising market in the years to come. So value addition would benefit a lot.

#### **Areas of Value Addition by Cooperatives Proposed**

The following areas could be economically viable for value addition by cooperatives in Puducherry.

##### **(i) Handling of Fisheries Production**

The intrinsic and extrinsic qualities of fish vary considerably depending upon the

location of the fishing ground, (on the high seas) species, water quality and harvesting techniques. The primary objective of any handling method is to preserve the quality of the fish by bringing down the temperature near to 0°C as quickly as possible. The quality of fish begins with harvest and carrying through the harvest to consumption. Careful handling of fish and shellfish board on the vessel or and during transport to the processing plant is critical, if the high quality of the product is to be maintained. The factors such as delay in handling and chilling the catch, poor temperature control of the fish hold, damage from rough handling, poor standards of gutting,

bleeding and wasting the fish and mechanical damage due to the over filling of the containers have a deleterious effect on the quality of fish and result in reduction of shelf life and loss of weight.<sup>6</sup> So cooperatives can avoid such factors and ensure quality handling with members support.

#### **(ii) Handling during Pre-processing and Processing**

The type of handling the fish receive on shore/land during preprocessing and processing will determine the quality of the final product before a consumer. Every stage from capture, handling, and processing, and eventually to sale, to the consumer, involves some loss of quality. Different raw material specifications are used for each product. For example, chilled fish for immediate sale on the local market may not be perfectly fresh but may still be acceptable to the customer. But in the case of a product such as frozen fillets, fresh raw material will be required as it will have to withstand the rigors of the freezing process and extended cold storage before it reaches the consumer. Hence during pre processing stage raw material is graded according to the suitability for various processing methods. Handling the fish (raw material) during processing varies with types of the fish, the processing methods and the intended final product.<sup>7</sup> This is exactly where cooperatives could encase upon.

#### **(iii) Fish Processing by Cooperatives**

Fish is a highly perishable food which needs proper handling and preservation if it is to have a long shelf life and retain a desirable quality and nutritional value. The term fish processing refers to the processes associated with fish and fish products between the time fish are caught or harvested, and the time the final product is delivered to the customer. Fish processing can be subdivided into fish handling, which is the preliminary processing of raw fish, and the manufacture of fish products. Another natural subdivision is into primary processing involved in the filleting and freezing of fresh fish for onward distribution to fresh fish retail, and catering outlets, and the secondary processing that produces chilled, frozen and canned products for the retail and catering traders.<sup>8</sup> The fisheries

cooperatives can play a significant role in the field of activity.

#### **(iv) Fish Preservation by Cooperatives**

The fish preservation techniques are needed to prevent fish spoilage and length of shelf life. They are designed to inhibit the activity of spoilage by bacteria and the metabolic changes that result in the loss of fish quality. Spoilage bacteria are the specific bacteria that produce the unpleasant odours and flavours associated with spoiled fish.<sup>9</sup> So it is highly important to help adopt modern preservation by cooperatives. Preservation can be done, both for short and long duration, by chilling, cleaning, gutting and preservation and storage by the cooperatives as a commercial activity.

As part of short time preservation, chilling is done, icing is one kind of chilling method. High heat absorption capacity of ice makes it an ideal medium for chilling of fish. Icing of fish is easy that does not involve sophistication or high level of skill. Ice is available must everywhere in the country and the fish can be kept for a couple of weeks (20-30 days) in acceptable quality if proper icing is done.<sup>10</sup>

As part of long time preservation the fishes are passed through the cleaning, gutting, conservation and storage processes. Conservation and Storage is necessary to keep the dead fish in fresh condition for quite a long time. This is achieved by employing any one of the methods like freezing, drying, salting, smoking and canning.<sup>11</sup> The fish catch will be cleaned with clean water at the sea shore/village<sup>12</sup> to remove the bacteria, slime, blood, faeces and mud, etc from the body surface of the fish. Average – sized fish must first be gutted and scaled and if possible, the heads should be removed, in order to prevent any risk to contamination by bacteria and enzymes. They are then cut into slices, fillets or large piece before being placed over the fire. Because the product is thicker, smoking takes longer, but afterwards, the fish keep better.<sup>13</sup>

So it is clear from the above that there is a strong need for establishing a systematic Value Chain Management (VCM) in this sector, preferably in cooperatives as given in Statement 1.



**STATEMENT 1**  
**Value Chain Management (VCM) Proposed**

Sl. No.	VCM Process Functions	Description
1.	Cleaning	After catching fish from sea, the fish catch will be cleaned with clean water at the sea shore/village.
2.	Sorting	After cleaning, the fish catch will be sorted according to the size into groups.
3.	Grading	After sorting, the groups are regrouped according to the type of species. The grade will be given to the species according to the demand in the market.
4.	Weighing	The graded fish will be weighed for packing.
5.	Deheading	In market place/ sea shore/ warehouse, the retailer/ processor will process the fish for convenience purpose. The head part of the fish will be removed to cook.
6.	Removal of Slime	The slime of the fish will be removed.
7.	Cutting Fins	The fins of the fish will be removed.
8.	Meat Bone Separation	To make the fish boneless, this separation will take place.
9.	Icing	After fish is fully processed, the pieces are mixed with ice for storage purpose.
10.	Packaging	The mixture of fish pieces are packaged in termo cool packages.
11.	Branding	The fish produce will finally be given brand names along with commercialisation tools.

**Source:** V.V Devi Prasad Kotni. A Study on Value Chain Management Practices of Fresh Fish. An Empirical Study of Coastal Andhra Pradesh Marine Fisheries. IOSR Journal of Business and Management. P - 83

**VCM for Puducherry UT Proposed**

Based on the extent of utility and purpose, the researcher proposed a VCM for Puducherry UT, especially by cooperatives in both Tamil Nadu and Puducherry states for more meaningful and useful value addition in fisheries sector. This is for the ultimate benefit of the consumers and through which the supply chain partners at different locations would create a permanent headquarters and sub - centres as well. Proper coordination with cooperatives in Tamil

Nadu would ease the situation. All what is needed is to make use of the cooperative godowns with an added cold storage facilities wherever necessary. Please see the VCM map which links headquarters with sub centres.

As seen in the diagram, the VCM based Route Map is created for every 40 Km distance on an average, as given below. Each centre would carry out the VCM functions and serve as a model point for supply of quality stock.

Sl. No	Headquarters	Sub Centres
1.	Puducherry to Thiruvanamalai	Villupuram, Thirukovilur.
2.	Puducherry to Vellore	Tindivanam, Vandavasi, Arani, Arcot.
3.	Puducherry to Coimbatore	Villupuram, Perambalur, Thruchirapalli, Karur, Kankeyam, Sular.
4.	Pudicherry to Dharmapuri	Tindivanam, Gingee, Thiruvannamalai, Chengam, Uthangarai.
5.	Puducherry to Selam	Cuddalre, Panruti Ullundurpet, Kalladurichi, Attur, Vazhapadi.
6.	Puducherry to Tiruchirapalli	Cuddalre, Virudhachalam, Dindugal, Perambalur.

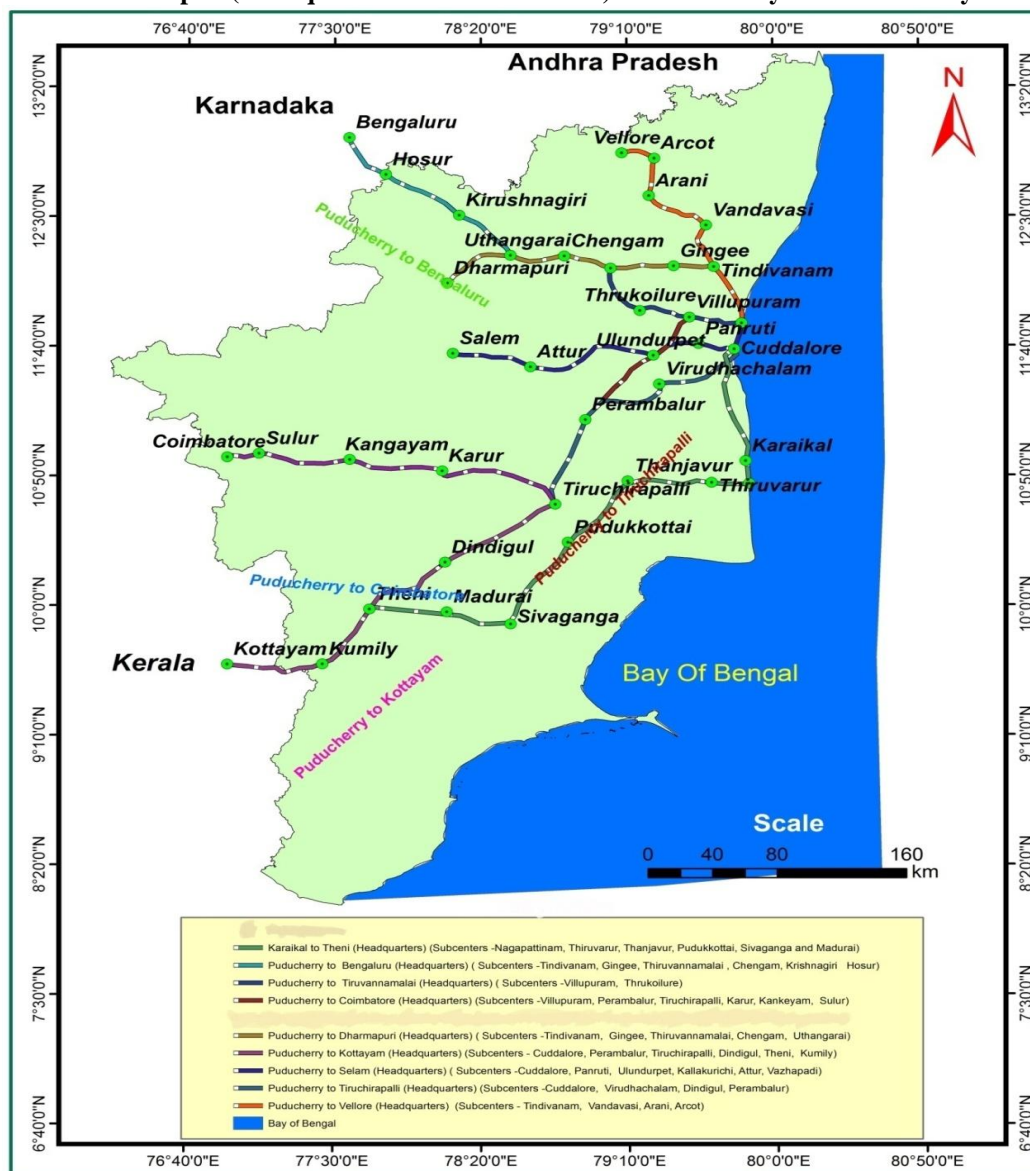


7.	Puducherry to Bangaluru	Tindivanam, Gingee, Thiruvannamalai. Chengam, Uthangarai, Kirshnagiri, Hosur.
8.	Puducherry to Kottayam	Cuddalore, Perambalur, Thiruchirapalli, Dindigul, Theni, Kumily.

Accordingly the fresh catch would be stored in headquarters and the excess stock piling up day by day would be moved to various sub centres as required. A standard price - chart could be maintained at every centre as the price will

vary according to the difference in distance. Of course this needs the assistance of fleet support from producers for their own benefits and much widened market at their reach.

**VCM map of (Headquarters and Sub - centres) in Puducherry Union Territory**



### Conclusion

Puducherry UT is capable of updating its fisheries technology with its committed and dedicated population of fishermen. The cooperative sector has to extend a helping hand for the overall growth and further string thinking living in interior parts of the country.

of fisheries sector, especially by improved VCM practices as suggested above. It is for the policy makers to allocate budget funds and help create a world – class system of supplying quality stocks to the ultimate consumers

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