

Supply Chain Management of Cash Crops and farmers' welfare in Garhwal region of Uttarakhand

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ABSTRACT

Cash crop is now trending to enhance the profitability of farmers. In simple words, "a cash crop is a farm produce grown from the perspective of availing profits as compared to subsistence crops which farmers grow to make ends meet." Profit is not only derived from productivity but also gets affected by supply chain management of agriculture produce. It is very important to channelize all linkages in a systematic way to reduce losses and maximize profit.

This paper is focusing on cash crops (Sugarcane, apple, ginger, Rajma, and Potato) supply chain management. The study is based on primary data collected through scheduled floated among 70 respondent including farmers in Uttarakhand (Dehradun, Haridwar). Schedules' indicators are prepared on the basis of literature survey. This study explored the various factors affecting supply chain management and impact of SCM on farmers' welfare in plain districts of Uttarakhand. It also describes the challenges and issues in supply chain management.

1. Introduction

The agriculture sector and allied sector is playing a pivotal role in Indian economic growth and development. Agriculture sector involved economic activities which assure large proportion of employment of country. According to the annual report of the state of Indian agriculture 2015-16, since the beginning of economic reforms in India, experts found high volatility in the growth of contribution of agriculture sectors. It recorded 4.8% annual fluctuation in eight five year plan (1992-96) to a low of 2.4% during the 10th plan (2002-06). It depicted 4.1% growth in the eleventh plan (2007 -12) because of emphasizing "inclusive growth" aspect of development and growth.

It employed 54.6% of the country population (census 2011) and it contributes 17% to the country's gross value added (current price 2015-16, 2011-12 series)¹. Recently India recorded 7.8% of total global agricultural output and contribution of agriculture sector in Indian economy registered 6.1%².

India is a diversified country in terms of culture, natural resources and economic activities. An agriculture sector also poses various pattern and operational functions in it to generate output. These operational functions create inter-linkages between natural resources used for production and agriculture producers.

Production process incorporates capitals using land, and machine. Agriculture production process also followed the same required capital named cropping land, farmers, and people for labor and technology and equipment. In India

¹ Annual report 2016-17, Department of agriculture cooperation and farmers welfare

² Statisticstimes.com July 8, 2015

181.95mha (53.3%) is agriculture land in that net sown area is 139.9mha (42.57%) and the net irrigated area is 63.7 million hectare³ but according to Indian Labor Market report, workforce participation in agriculture sectors declined from 2011-12 (49.4) to 2012-13 (29.96). This declined pattern of workforce participation in agriculture sectors depicts trailing situation which renders shifting occupation of agriculture farmers.

The cropping system of Uttarakhand differs with height, distance, and variation of climate changes. The regional agriculture producers not only recognize but embrace these factors to framing their farming practices (Tuteja, 2013). We know very well that Uttarakhand is an underdeveloped agriculture economy, still large proportion of the population depends on agricultural activities for income generation. The major portion of farming is occupied by subsistence food crop and less proportion is produced for the commercial purpose known as cash crops (Sati, 1993). Farmers often cultivate three crops in two years of agriculture is confined to the fertile valleys in the hills by using inputs like HYVs (high yielding varieties seeds), chemical and fertilizers etc (Shiva et. al., 2009).

Moreover, for supporting agriculture sectors in Uttarakhand, State government decided to promote commercial farming to encourage cash crops. In a bid to attract farmers to grow cash crops, Uttarakhand government approved an action plan of 40 crRs. with a provision of up to 75% grant. Under this plan, the farming of vegetables, fruits spices, and floriculture would be promoted on an area of 50 to 75 % for growing vegetables and spices nearly 20000 poly-houses would be developed under "chief minister horticulture development scheme" (Business line – The Hindu 28 April

³ State of agriculture 2015-16

2011). One more project is running in Chamoli district with the objective of efficient production of fruits and vegetables by utilizing poly-houses (Krishi sutra 2, 2013).

The major cash crops of Uttarakhand can be categorized into several categories (Denial et.al., 2012) these are given below:

Food-grain:- Rice, wheat, paddy, maize, mandwa, and Sanwa etc.

Pulses: - Rajma, Kulath, Gaith, Bhatt, Urad, Gram etc.

Oilseeds: - Soybean, groundnut, sunflower, mustard etc.,

Fruits:- Apple, Lychee, Pulm, Nashpati, and Malta etc.

Vegetables:-Potatoes, capsicum, green vegetables, Pea, Bottle gourd, Brinjal etc.

Spices: - Chilli, ginger, garlic, coriander, and turmeric etc.

Others: - Sugarcane, jute, cotton etc.

Cash crop mentioned above raise the requirement of marketing concept in Uttarakhand state. Furthermore, Marketing of agricultural products is not an easy process, it is a composition of complex activities which is succeeded by an integrated procedure (Lathore & Delmas, 2009). The special feature of agriculture marketing is that it includes both sides of

agriculture production that is, input marketing and output marketing (Ohal, 2015). In this context, input marketing is quite a new concept in comparison to output marketing but for balanced growth, we need to fetch equality in both concepts and highlight the coordination between input marketing system and output marketing system (Kamra, 2004). Marketing of agricultural products is not an easy process; it is a composition of complex activities which is succeeded by an integrated procedure. The special feature of agriculture marketing is that it includes both sides of agriculture production that is, input marketing and output marketing (Tongeren, 2008). In this context, input marketing is quite a new concept in comparison to output marketing but for balanced growth, we need to fetch equality in both concepts and highlight the coordination between input marketing system and output marketing system (Acharya, 1987).

However, supply chain plays a pivotal role in price and regulation of agriculture products. Supply chain covers all market activities to link between farmer and consumers for deciding final price of the product (Mau, 2002). These market activities are further divided into several groups to measure the current status and gap of agriculture marketing (Arora, 2015).

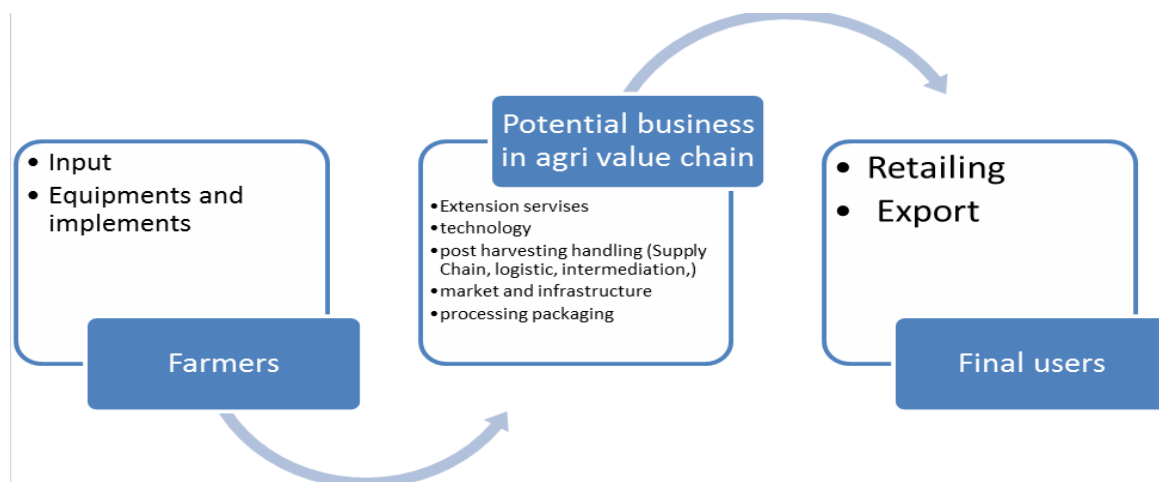


Figure 1: supply chain in agriculture marketing: source:- VPS ARORA, " Historical perspective of a regulatory framework for fruits and vegetable marketing in India"

Agricultural supply chain infers dealing the relationship between the tracings and businesses, accountable for the efficient production and supply of products at the farm level to the consumers to meet their requirement, reliability in terms of quality, quantity, and price (Porto, Chauvin N. A., 20014).

2. Objectives of the study

- To assess the supply chain management of cash crops in Uttarakhand.
- To analyze the challenges and issues related to supply chain management in study areas.
- To analyze the impact of supply chain management on farmers' standard of living
- To examine the influence of existing supply chain on an aggregate loss of farm produce.

3. Literature Review

Yuming Li and chunsan li (2011) discussed agribusiness, as a sub-system of China's market economy system, has an

extremely important position. The improvement of agribusiness supply chain performance is an important way to enhance the market competitiveness of agricultural enterprises in China.

Rakesh Patidar et al (2012) found that marketing cost through different channels of different villages, by the adoption of the proposed method by farmer can save funds. Strengthening of agriculture will help in the upliftment of the farmers but also benefit the larger section of the rural poor who are directly engaged in agriculture or indirectly linked with agriculture as consumers.

Sazzad Parvez (2014) explored the major issues and problem faced by Indian agriculture for food security in terms of inadequate infrastructure and highly efficient supply chain in the context of information technology. The study also examined the critical issues of each subsystem of agriculture supply chain starting to the input to the consumer, with a view to integrating them in efficient and effective manner.

Somashekhar, Raju, H. Patil (2014) critically reviewed the scenario of agriculture supply chain management in India by throwing a light on role of agriculture supply chain management, Agri-food supply chain management, Agriculture marketing in India, marketplace for agriculture products, APMC, contract farming and private sector initiatives and found that, the agricultural marketing sector is characterized by fragmented supply chain, huge postharvest losses, multiple market intermediaries; higher transaction cost, lack of awareness and several other socio-economic factors are some of the acute problems being faced by the Indian agriculture.

SauravNegi and NeerajAnand (2014) assessed The entire supply chain of fruits and vegetables in Uttarakhand and found the subject matter laden with the various issues which resulting to poor price realization of growers on one hand and exorbitant prices paid by consumers on the other. Highly inefficient supply chain and cold chain infrastructure is

Hetu, weiling & kwok (2013) investigated the impact of two different dimension of supply chain integration at the two aspects of firm performance in emerging economy. The study found the moderating effect of market orientation on the relationship between supply chain management and firms' performance.

Raise M. and Sheor A (2015) described the characteristics of fruits and vegetables such as perishability, seasonality, bulkiness and delicate nature of the products coupled with inadequate storage and transport facilities, the supply chain can be made efficient by reducing the length of the chain improving cold chain facilities. The supply chain management in vegetables has to be improved in all the stages of the supply by adopting global best practices in storage, packaging, handling, transportation, value-added service etc.

Montalbane, Nenci and Salvatici (2015) indicated that value chain assessment shed light on all actors participating in each link. The pattern and extent of participation, opportunity to facilitate and link channelization affect the operational functions of value chain. The value chain approach is being used to direct the high impact and sustainable initiative focused on improved productivity, competitiveness, entrepreneurship and the growth of small and medium firms.

Gunwant, Rawat & Meenakshi (2015) analyzed production and marketing practices of vegetables and fruits in Nainital and Udham Singh Nagar of Uttarakhand. Authors stated that Uttarakhand is enjoying surplus growth of vegetables and fruits

but supply chain management is occupied with inefficient elements across the entire link of entire link of channel.

Ganesh (2017) applied qualitative techniques and found in his study that the Indian agriculture suffers from various problem like stumping bargain capacity of farmers, intermediaries, existence of informality in farm sector, unstructured marketing process of farm produce, fragmented supply chain, installation of poor marketing infrastructure, massive wastage of resources, ineffective warehousing and storage facilities, mishandling of rapid perishability of high-value commodity, unavailability of effective packaging, branding, grading and certification of agricultural produce.

Banjaw(2017) in order to reduce a loss of horticultural crops suggested implementing appropriate post-harvesting handling included managerial and technical component and need for improving marketing system and infrastructure.

Naik & Suresh(2018) demonstrated that the growing pressure on business and government to pay more attention towards environmental and resources consequences of ever increasing, production, distribution and consumption of agro-based products. Encouragement program of participation demands sources of networks, institutional support and aid to meet the essentials of food security and quality regulation. Further recommendation was made to improve the public & private investment in retailing to ensure the structure of supply chain of agro-based product.

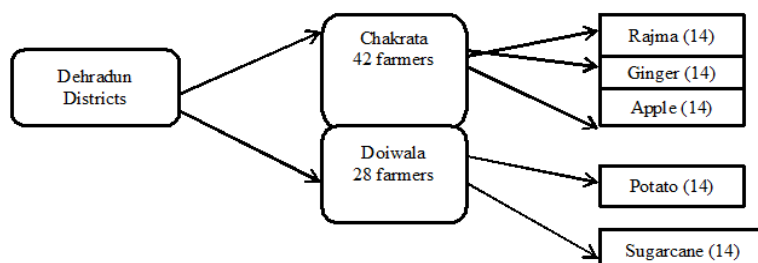
4. Research methodology:

The study is explorative and descriptive in nature. Qualitative and Quantitative methodologies are used to analyze and examine the objectives of the study. Primary data is used to explore the study. Data is collected through transect walk and survey of villages. Variables of schedules are chosen on the basis of previous works of literature in the field of agriculture supply chain management.

Likert scales with five points are used for measurement of existing variable in the study namely supply chain activities performance including Loss assessment and farmers' standard of living.

Garhwal region of Uttarakhand consisting 7 districts among that two is plain districts. One plain district is selected to conduct the study. Furthermore, two villages are selected randomly (Doiwala and Chakrata). Clustered sampling is used to select respondent to interview. 70 respondents are randomly selected to interview including farmers of cash crops (Sugarcane, Apple, Potato, Kidney-beans, and Ginger).

Sampling Frame for the study:



To identify the dimension of supply chain management, literature review provides the substance. Reliability of scale is done through cron-bach Alpha Test.

Supply Chain Management encompassing 10 statements that measure the status of activities of supply chain management and loss of agricultural produce with existing supply chain. This includes four statements in terms of quality, quantity, monetary and time loss during the supply of produce. The Cronbach Alpha test of combined reliability test for supply chain management and loss assessment shows .705 values that indicate the good reliability of scale applied to the dimensions. Similarly, Farmers' welfare scale shows moderate reliability (.681).

Reliability Statistics

Name of variables	Cronbach's Alpha	(No of Items)
Supply Chain Management	.705	14
farmers' welfare	.881	4

Source: SPSS Statistical tool Output Viewer

5. Conceptual framework and hypothesis

The following figure shows the inter-linkages among the variables. Supply chain management is defining all the content including transportation, road connectivity to the farm market, Warehousing and technical equipment availability for crop productions. These components of supply chain management directly mitigate the loss of farm produce like crop quantity, quality, monetary loss of farmers & traders and delay in delivery of farm produce. supply chain management is important factor that enhance farmer' welfare in terms of improved standard of living. Supply chain management influence farmers income by reducing loss, profitability affects the availability of resources to the farmers and durable households' goods. It also provides the contingency savings to the farmers.

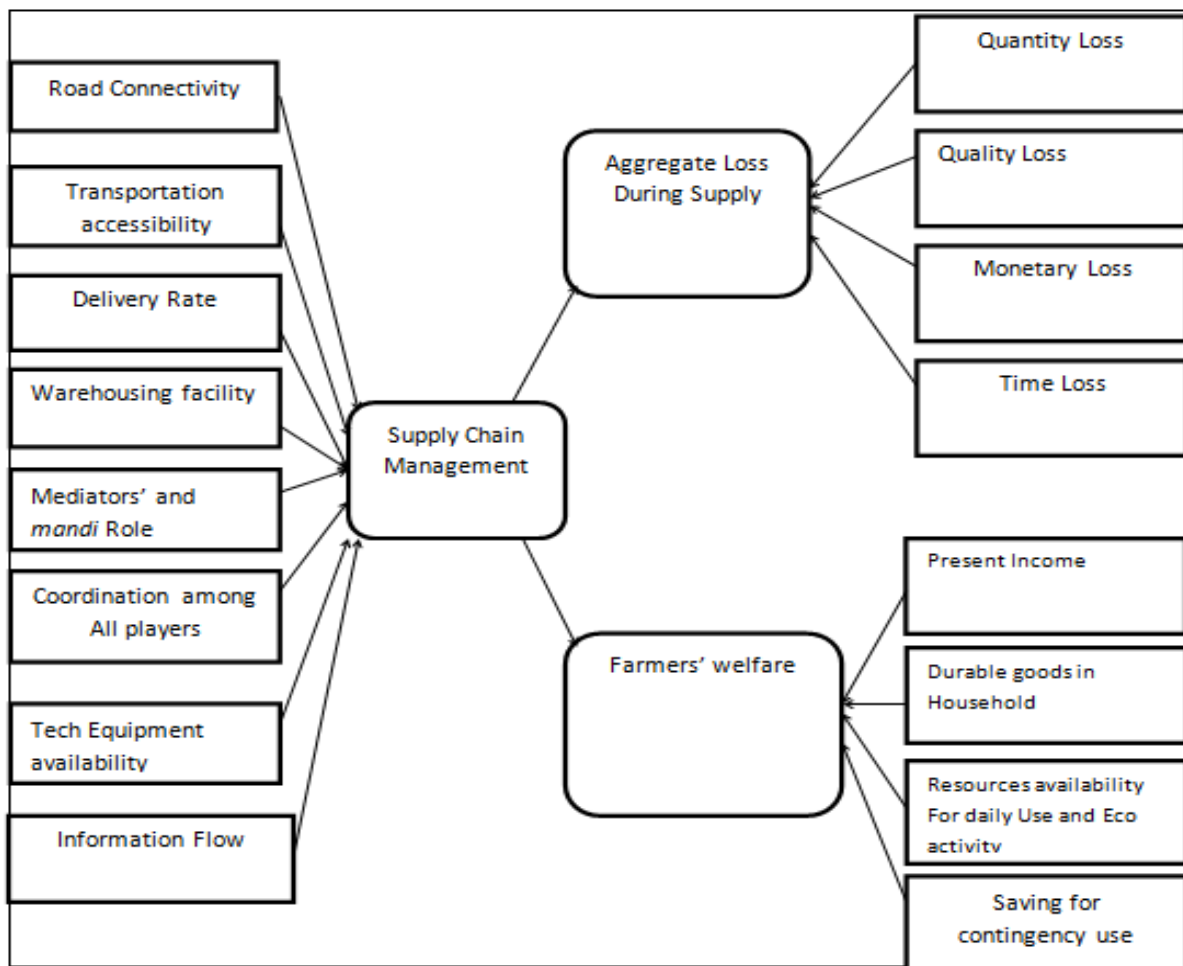


Figure 2: interdependency diagram of the variables

6. Working Hypothesis

H1: Supply chain management positively affects farmers' welfare.

H2: Supply chain management reduces the loss of agricultural produce.

H3: Existing supply chain management increase farmers' income.

H4: Existing supply chain management improved the situation of trading of agricultural produce.

7. Data Analysis

Agriculture needs youth skills and labor force to increase profit and crop productivity.

Demographical details of Respondents (Farmers):

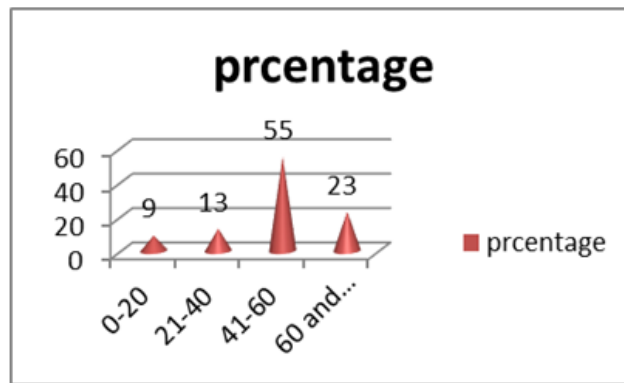


Figure 3: Age frequency distribution of respondents

However, this study shows the inverse picture of demographic engagement of farmers (Fig-3). More than 50% of farmers belong to the (41-60) age group and 23% are above 60 years. They depend on other family members for their post-harvest activity, who are not fully engaged in agriculture. Only 13% are between 21 to 40 years age group. Few are less than 20 years but entails very small proportion of the population.

Many education policies are functioning in rural as well as urban areas according to its schemes' objectives for the upliftment of the deprived section of the society. Rural education plays a very important role in rural development and helps to mitigate many other issues related to the growth of the areas. It is assumed that special education required for the framers to enhance the income and crop share but they are deprived of general education. Only 3% are postgraduate and 13% are

Educational detail of farmers:

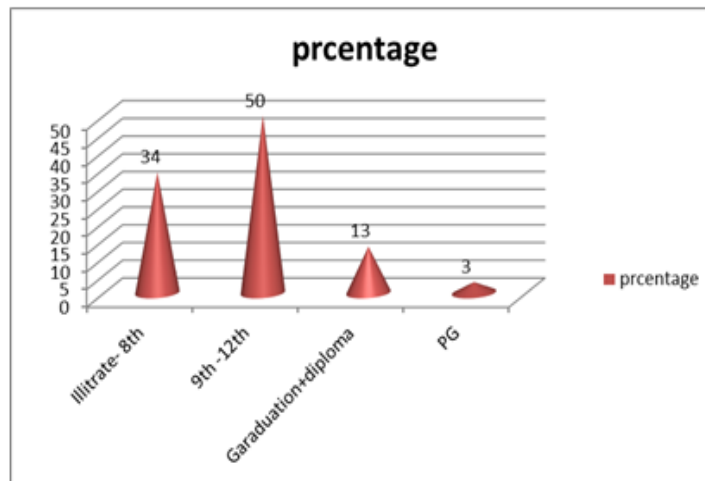
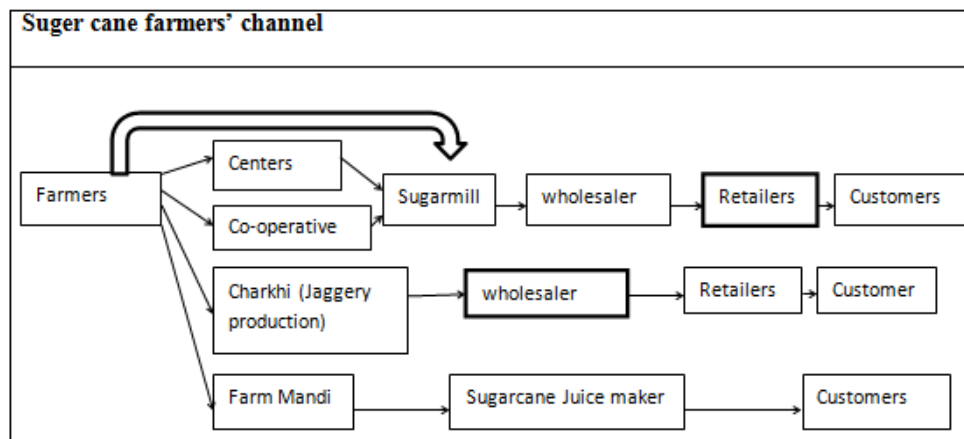


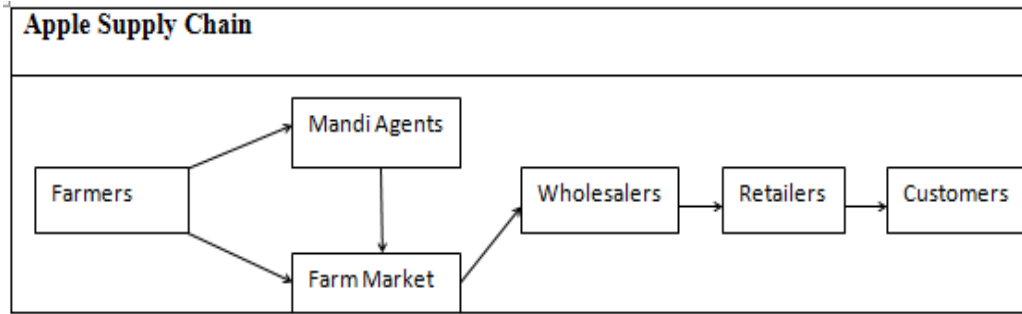
Figure 4: Percentage distribution of education qualification of the Respondents

Supply chain Adopted for crop selling to farm market by Respondent (Farmers):



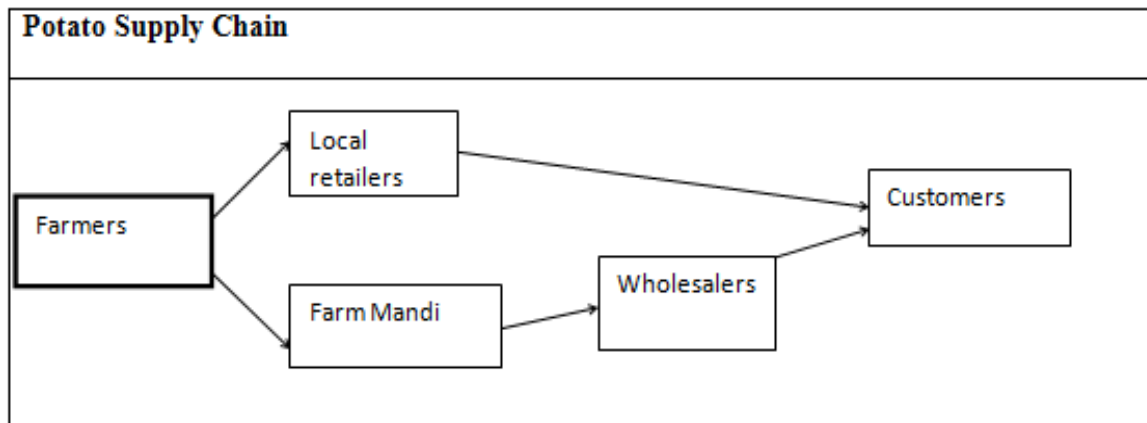
In the above supply chain, farmers used to sell their Sugarcane to the sugar-mill through the channel of cooperative society or Sugarcane centers. Through this channel farmers get 300-315Rs. per quintal. Another channel is *Charkhi* (Jaggery production center) . This is the point where jaggery is produced for consumers consumptions. But these centers pay only 200Rs. per quintal. This is adopted in the situation of less

demand from Sugarmill. Another option opted by farmers to sell their crop is *Farm Mandi*. this is the place where they sell their sugarcane to the mandi traders at 250-300 Rs per quintal. But this is only in summer season. Because this channel links to the juice makers, Juice is demanded in summer only. Hence Sugarmill is the best option for the farmers to sell their sugarcane because of consistency in quantity demanded.



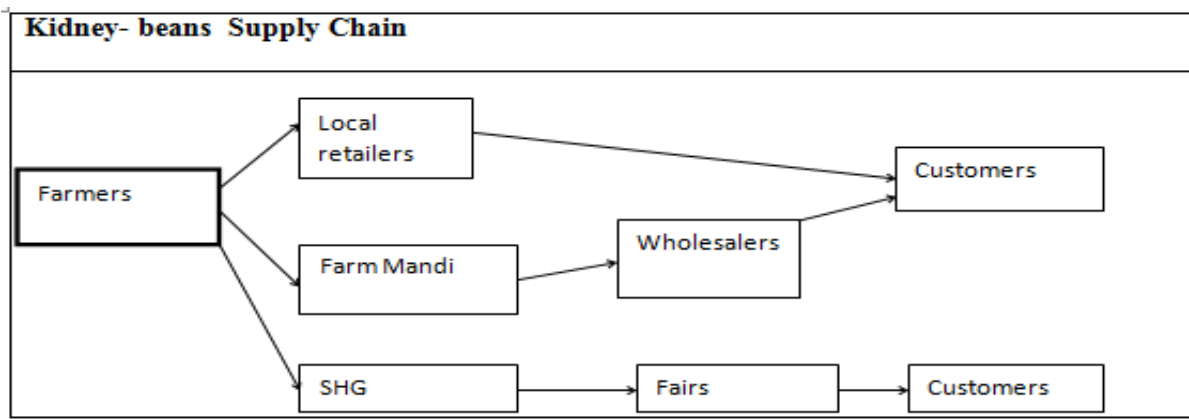
Apple farmers are selling their apple to the farms' markets or mandi agents. They sell their Crop in Boxes of 20 Kg and grade according to the quality. They got a good price (2500Rs. per boxes) of apple in Farm Market but there is a very uncertainty of demand and further connection. This Farm Market is not able to accommodate the huge quantity or all quantity of farmers due to small sizes of markets. Another option is mandi agents in Sahiya, Vikashnagar, Dehradun, and

Delhi (out of the state). They Charge average 6% of commission and prices are decided on the basis of daily trader's auctions. In Interview, it is revealed that *Mandi* is a good option to the farmers but if a commission of agents is removed. Sometimes they got the highest price because of a large number of traders' competition as they can accommodate all quantity produced by farmers.



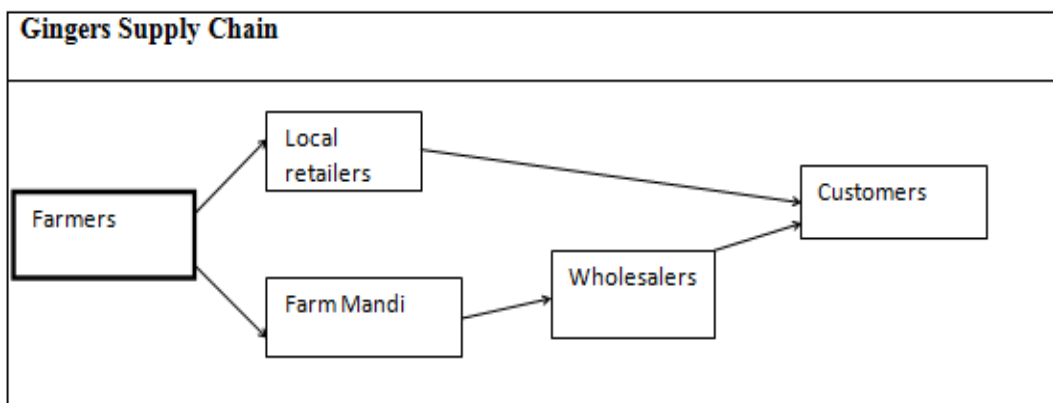
Farmers adopted two channels to sell their potato. In the case of small production they sell out potatoes to the local

retailers at market price but in the case of huge production, they prefer to mandi to get the best price by auction.



Like potato Rajma or kidney beans also sell out through mandi auction or local market. There is the number of SHG and NGOs are working in the direction of sustainable development of hilly crops. Hence Rajma is covered by many

SHGs for its packaging, grading, cleaning and transporting to the final markets. Basically, they target city trade fairs to sell their products at a high price than general sales.



Ginger follows the same pattern as potatoes supply chain. Most of the farmers who cultivated potatoes also produce gingers and sell out through Government mandis but small scale production leads to sell in the local market at market price.

Supply Chain Analysis dimensions:

As per the literature Review, various dimensions were identified. On the basis of the pilot study, only eight variables

are finalized with higher reliability. Respondents are satisfied with Road connectivity, Transportation, Delivery Rate, Mediators role and Co-ordination as values are most likely equal to 4. Unlike Warehousing, technology and information recorded the neutral response of respondent (values ≈3). All values are significant as its less than or equal to 1.

Table 1: Supply chain Dimensions

S No	Dimension	Mean	Standard Deviation
1	Road Connectivity	3.80	.878
2	Transportation	3.89	.671
3	Delivery rate	3.63	.904
4	Warehousing	3.41	.691
5	Mediators' Role	3.66	.849
6	Co-ordination among Mediators	3.59	.893
7	Technology adoption for input and output supply	3.09	1.01
8	Information circulation in existing SCM	3.29	1.10

Source: Derived from SPSS Calculation, Primary Data survey

Quantity Loss Assessment:

Loss assessment classified into four categories consisting Quantity loss, quality loss, monetary loss and time loss (logistic timing) on the scale of (no loss=1, less loss=2, moderate=3,

high=4, very high=5). The result shows, existing supply chain improves the situation and recorded minimum loss of all categories significantly. But the nominal loss can be seen on the quality loss.

Table 2: Aggregate loss measurement parameters

S No	Dimension	Mean	Standard deviation
1	Quantity loss	1.26	.61
2	Quality loss	1.33	.85
3	Monetary loss	1.27	.70
4	Time Loss	1.27	.61

Source: Derived from SPSS Calculation, Primary Data survey

Evaluation of existing Supply Chain Management and Farmers welfare:

Farmers' welfare includes income and situation improvement. The analysis shows that farmers' income improvement due to existing supply chain management

recorded neutral response aggregately (values ≈3). Unlike farmers' income, the situation improved recorded (values ≈4) farmers are satisfied with an improved situation like availability of Inputs, farm market and accessibility of supply.

Table 3: Supply chain performance by farmers income and situation improvement

S No	Dimension	Mean	Standard Deviation
1	Farmers' Income	2.96	.824
2	Situation Improved	3.51	.944

Source: Derived from SPSS Calculation, Primary Data survey

Farmers' welfare and standard of living:

Table 4: Farmers standard of living measurement

S No	Dimension	Mean	S.D.
1	Farmers' Total income	3.14	1.05
2	Durable goods in Households	3.13	1.12
3	Resources availability for daily life and economic activities	3.27	1.02
4	Saving for contingency	2.97	1.16

The recorded responses revealed that farmers are not satisfied by their standard of living. Their income was just for the survival and they don't have adequate durable goods for their livelihood yet resource availability depicts minor better sufficiency than other standards. But contingency fund is not available with farmers.

Furthermore, this study examined whether these farmers' standard of living get affected by existing supply chain or not.

The following tables show the supply chain Impact on Farmers' welfare and Quantity loss during the supply of agriculture produce. An analysis shows that Supply chain Management has a positive influence on farmers' welfare. It recorded 20% (approx) marginal impact on farmers' standard of living. If we improvise existing supply chain then farmers standard of living will be improved by 20% in the study area. Though it is a very low impact with .161 significant level, we can't ignore this impact as it is associated with farmers' welfare.

Table 5: impact of supply chain management on farmers' standard of living

Coefficients		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	3.161	.335		9.449	.000
	FW_STD	.143	.101	.169	1.417	.161

a. Dependent Variable: SCM

Furthermore, supply chain management is also responsible for loss occurred during delivery of farm produce. Warehousing, storage facilities, information dissemination and

coordination among all farm players play an important role to reduce the loss of farmers as well as products.

Table 6: Impact of supply chain management on an Aggregate loss of farm Produce

Coefficients		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	4.122	.215		19.151	.000
	Aggrt_loss	-.396	.151	-.304	-2.629	.011

a. Dependent Variable: SCM

Analysis depicts that supply chain management has significant (.01) negative impact on loss occurred during the product delivery to the final consumers. The better supply chain management reduces the aggregate loss of the farmers and traders by 30.4%.

Hence study suggested that supply chain management is the thrust area of farm investment to enhance farmers' standard of living and mitigate the loss during the supply of farm products.

8. Conclusion and Recommendations

H1: Supply chain management positively affects farmers' welfare.

This hypothesis is true. Supply chain management is an important factor to contribute towards Farmers' welfare. Although its impact score is very low but can't nullify this fact.

H2: Supply chain management reduces the loss of agricultural produce.

Yes, the Existing supply chain is successful to mitigate significantly the aggregate loss during the delivery of farm produce from one point to another point.

H3: Existing supply chain management increase farmers' income.

Recorded responses are not indicating that existing supply chain increase farmers' income but also not declining. Hence there is neutralizing response recorded against this hypothesis. Farmers' income is not affected by existing supply.

H4: Existing supply chain management improved the situation of trading of agricultural produce.

Yes, existing supply chain improved the situation of farmers' trading system. Earlier farmers were forced to sell mediators or agents in the areas but now they are accessible to the government mandis and sell their produce at an auctioned price.

It is a fact that channelization of any commodity from the origin point to final point affect both parties in many ways. Thus agriculture produces supply chain affects both consumer and producers. In the above analysis, various factors explored like road connectivity, warehousing facilities, transportation, mediators and information sharing is the important parameter of supply chain management.

Furthermore, the study raises a question about farmers' income increment or improvement with neutral responses.

Though it is revealed by the open-ended interview in the section of policy suggestion, they all are satisfied with existing supply chain but its impact on farmers' benefits or income is not satisfactory. Information sharing and logistic technology are not at par value. There is a lot of space to work upon and utilize the area efficiently. Mostly Farmers are dependent on self-storage and not aware of government provided warehousing facilities. This can be easily observed that warehousing parameter indicates satisfaction level of farmers as they have their own facilities but not have large capacity and techniques to store produce for a long term.

Supply chain varies from crop to crop and region to region. Sugarcane supply chain differs from other crops in many ways as its price and demands are least fluctuating. Potato and ginger are following the same pattern to flow from origin point to sale point but Rajma incorporates many SHGs to increase the profitability of farmers. Apple is still facing mediators in the supply chain as the apple- farmers' are not getting a good price in the local market or by auctions.

Therefore it is recommended to improve information sharing technology and incorporate local instrument to disseminate market or logistic information. State Government should also implement practically the warehousing plan and cold storage model to avoid product quality loss in Uttarakhand.

References

- Acharya, S.S. (2004). *Agricultural Marketing*. Oxford University Press, IHB
- Andreyeva T. (2010). Impact of food pricing on consumption; A systematic review of research on the price elasticity of demand for food: *American journal of public health*, 100(2), 216-222
- Annual report 2016-17, Department of agriculture cooperation and farmers welfare
- Arora V. P. S.(2015). Historical perspective of a regulatory framework for fruits and vegetable marketing in India
- Banjwa TD. (2017) . Review of Post-harvest Loss of horticulture crop in Ethiopia: Its Causes and Mitigation Strategies. *Journal Of Plant Sciences and Agriculture Research*. 2(1).
- Chand R. (2017). Doubling Farmer Income. National Institute for Transforming India, GOVT of India. New Delhi. Niti Policy Paper. No-1.
- Chauvin AN& Porto G (2014). *Agricultural Supply Chains and Farmers Constraints: Welfare Impacts in ECOWAS countries*. Working Paper No 2014-20.
- Daniel JN., Sohani GG. , Sharma RV. & Roy SS. (2012).sustainable rural livelihood creation and natural resource management in central and western Himalayas. BAIF Development Research Foundation, Pune
- Ganeshkumar, C., Pachayappan, M. and Madanmohan, G. (2017) *Agri-food Supply Chain Management: Literature Review*. *Intelligent Information Management*, 9, 68-96
- Iyyer AV. & Bergem ME. (1997). Quick Response In Manufacturer-Retailer Channel. *Management science*. 43(4). 559-570.
- Kamra AB. (2004) . the impact of market access on input use and agricultural productivity: evidence from Machakos district, Kenya. *Agrekon*. 43(2). 202-216.
- Krishi Sutra 2. (2013).Success stories of Farmers Producers Organizations. [http://sfacindia.com/PDFs/Krishi-Sutra\(Version2\).pdf](http://sfacindia.com/PDFs/Krishi-Sutra(Version2).pdf)
- Lathore A. & Delmas P., (2009) *Market Access and agricultural Produce Marketing: Promoting farmers' Initiatives*. Inter-reseaux Development Rural, CTA, AFD.
- Lee H.L. & Billington C. (1995). The Evolution Of Supply Chain Management Models And Practices At Hewlett Packard. *Interfaces*. 25(5). 42-63.
- Li Y. and LI C. (2011). Study on supply chain performance measurement system for agribusiness: IEEE, MACE conference proceeding paper.
- Mau M. (2002). Exploring Diversity in The European Agri-Food System. Presented paper At 10th EAAE Congress.
- Negi S. and Anand N. (2014). The supply chain of fruits and vegetable- agribusiness of Uttarakhand (Major Issues and Challenges): *Journal of supply chain management system*, 4(1&2).
- Parvez S. (2014). Food supply chain management in Indian agriculture: *African Journal Of Business Management*, 8 (14), 572-589.
- Raise M. and Shoer A (2015). The scope of supply chain management in fruits and vegetables in India: *Journal of food process technology*, 6:427.
- Roekel JV. , Kopiki R., Carry JE. And Boslie DM. (2002) .Building Agri Supply Chain: Issues And Guidelines.Word Bank Issues.

21. Sati, V. P. (1993a, b). Cropping Pattern in the Hill Environment of the Garhwal Himalaya: A case study of a village. *National Geographer*, 28(1), 31-37.
22. Siva V., Singh V., Dhankelman I., Negi B. and Singh S. (2005). *Biodiversity, Gender, and Technology Innovation Agriculture: Glimpse of the Indian Central Himalayas*. Navadya. New Delhi.
23. State of agriculture 2015-16
24. Statisticstimes.com July 8, 2015
25. Tuteja U., (2013) Baseline Data on Horticultural Crops in Uttarakhand, Agricultural Economics Research Centre University of Delhi
26. Van Tongeren, F. (2008). *Agricultural Policy Design and Implementation: A Synthesis*. OECD Food, Agriculture, and Fisheries Working Papers, No. 7, OECD. Publishing. doi:10.1787/243786286663.
27. Naik G., D.N. Suresh, (2018) Challenges Of Creating Sustainable Agri-Retail Supply Chains, *IIMB Management Review*
28. Gunvant VK., Rawat MS. And Meenakshi . (2015) .Analyzing Production And Marketing Practice: Pea & Tomato In District Of Nainital, U.S. Nagar In Uttarakhand. *International Journal Of Engineering Research In Management And Technology*. 4(6). 188-194.
29. MoMontalbano P., Nenci S. And Salvatici L. (2015) . Trade, Value Chains And Food Security. Background Paper. The State Of Agricultural Commodity Markets (Food And Agriculture Organization Of The United Nations Rome) .
30. He Hefu, Liu, Weiling Ke, Kwok Kee Wei, Zhongsheng Hua, (2013) "Effects Of Supply Chain Integration And Market Orientation On Firm Performance: Evidence From China", *International Journal Of Operations & Production Management*, Vol. 33 Issue: 3, Pp.322-346