## Extended Abstract
## Please do not add your name or affiliation

| Paper/Poster Title | **Value-chain of Stone Fruits in Uttarakhand and the Resilient Network of Intermediaries** |
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**Abstract prepared for presentation at the 97th Annual Conference of the Agricultural Economics Society, The University of Warwick, United Kingdom**

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| **Abstract** | ***200 words max*** |
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*Food production in India has increased manifold from 51 million tonnes in 1950-51 to about 252 million tonnes in 2014-15. However, farm income has not grown in the same proportion, as the Situation Assessment Survey (2003,2013) of farmers' data reveal. In this paper, I focus on two important supply-side factors responsible for farmers' exploitation- dependence on intermediaries, and lack of market accessibility due to poor infrastructure. This paper analyses the supply chain of stone-fruits in Uttarakhand, a hill state in northern India. I use original survey data constructed by doing a primary survey in Nainital district of Uttarakhand. The main objective is to trace the supply chain of stone-fruits and analyse the distribution of profits along this chain, while accounting for the topography of the hills and how it affects farmers' incomes and dependence on intermediaries. The study finds that high post-harvest (marketing) cost coupled with poor infrastructure and information asymmetry helps traders in wielding power over the farmers. Rich farmers fare relatively well as compared to their poor counterparts. This is primarily due to their dependence on the traders for credit- both for agricultural and non-agricultural purposes. Also, in the absence of storage amenities, farmers prefer to deal with intermediaries, even if this implies additional cost in the form of commissions of traders and transporters. However, calculations show that after accounting for opportunity cost of family labour, even the farmers with large landholdings incur losses. This study finds that in the absence of sound infrastructure, intermediaries become indispensable to the farmers. Policy implications of the paper include an urgent need to develop storage and food-processing infrastructure that will be as helpful to the farmers as the roads that help in improving market accessibility. Also, mere ICT tools such as cell phones can do little to increase farmers' profits, if not done in conjunction with an improvement in credit-lending and agricultural marketing institutions.*



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| **Keywords** | Agricultural Markets and Marketing; Cooperatives; Agribusiness, Agricultural Finance, Agricultural Policy; Food Policy; Animal Welfare Policy |
| **JEL Code** | Q130, Q140, Q180<br>see: www.aeaweb.org/jel/guide/jel.php?class=Q) |


| **Introduction** | ***100 – 250 words*** |
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The Indian farmer earns very less and is trapped in poverty for various demand-side as well as supply-side reasons. An important reason for the same is that a large number of agricultural commodities in India reach the consumer via traditional value chains where small-scale producers interact with various actors when they link with markets, including traders, logistics firms, processors and retailers. In developing countries, small farmers often cannot access organized markets directly. Instead, they sell to middlemen who resell their output to distant buyers. These middlemen appear to earn large margins, and they appropriate most of the gains from rising consumer prices. The large size of the market, poor transport, marketing and infrastructural facilities ensure that many isolated regional markets exist for farm produce. The

Sustainable Development Goal 2 as propounded by the United Nations aims to end hunger, achieve food and nutrition security and promote sustainable agriculture by 2030. This requires that small-scale producers be included in, and benefit from, the rapid growth and transformation under way in food systems. Also, the Government of India in 2016 set a target of "Doubling Farmers' Income" by 2022 in order to increase the income of farmers by various interventions in the farm and non-farm sectors. For these goals and reforms to be realized, it is essential to understand the problems faced by farmers and analysing whether the heart of the problem lies in the value-chain itself. Conventional theories focus mainly on sources of production costs, ignoring the role of marketing costs and margins that accrue to trade intermediaries. Thus, it becomes important to study about middlemen to assess whether they are facilitators or exploiters in the supply chain.

| **Methodology** | ***100 – 250 words*** |
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In this paper, I focus on two important supply-side factors responsible for farmers' exploitation- dependence on intermediaries, and lack of market accessibility due to poor infrastructure. I analyse the supply chain of stone-fruits in Uttarakhand, a hill state in northern India. Uttarakhand is the leading producer of stone-fruits (peach, plum, apricot and pear among others) in India. My main objective is to trace the supply chain of peaches and analyse the distribution of profits along this chain, while accounting for the topography of the hills and how it affects farmers' incomes and dependence on intermediaries. In this paper, I focus on the two most important actors of the supply chain- the farmers and the intermediaries-cum-wholesalers, or *Arhatiyas*. I use original survey data constructed by doing a primary survey in Nainital district of Uttarakhand, done using multi-stage stratified random sampling. In the first stage, villages are selected based on distance from the nearest agricultural market, or *Mandi* as well as the caste of the farmers. In the second stage, farmers from these villages are chosen on the basis of the size of their landholdings. The data has been collected by interviewing 200 farmers spanning across 20 villages of two different blocks. 40 traders in the traditional spot market have also been interviewed using purposive sampling, in addition to other actors in the supply chain such as transporters and processors. Both quantitative and qualitative data has been assimilated based on key-informant interviews as well as focus-group discussions with the various actors.

| **Results** | ***100 – 250 words*** |
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The descriptive statistics and standard OLS regressions find that high post-harvest (marketing) cost coupled with poor infrastructure and information asymmetry helps traders in wielding power over the farmers. Rich farmers fare relatively well as compared to their poor counterparts, characterised by smaller landholdings. This is primarily due to their dependence on the traders for credit- both for agricultural and non-agricultural purposes. There is an interlinkage of input-output and credit market. Small farmers enter into informal contracts with the traders who assist them in cash (for agricultural and non-agricultural activities) and in-kind (in the form of agricultural inputs like fertilizers or in the form of ration to feed their family during slack season). In lieu of this, farmers are bound to sell their harvest to the traders. Thus, *Arhatiyas* tie the output of farmers with themselves to establish farmer loyalty and ensure future supplies as commission rent is dependent on the value of the produce in each transaction. However, calculations show that after accounting for opportunity cost of family labour, even the farmers with large landholdings incur losses. The study also finds that farmers have limited options to market their produce outside the traditional spot markets, *mandis*. Also, because the traders deal in bulk and help the farmers dispense-off their produce quickly in the absence of storage amenities, farmers prefer to deal with them over other actors that specialise in agro-processing, even if this implies additional cost in the form of commissions of traders and transporters. The study finds that despite a large number of intermediaries options within the *mandi*, farmers prefer to deal with two or three intermediaries on an average. Social ties with intermediaries hailing from their own village or caste is an important factor in this regard. Also, results show that farmers get higher price when they engage directly in business with processors, retailers etc. But due to various services provided by intermediaries, such as purchase of the entire produce despite grade and quality, provision of input and credit etc., farmers continue to trade with the intermediaries.

| **Discussion and Conclusion** | ***100 – 250 words*** |
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This study can be seen as an addition to the existing literature on the supply-chains of horticultural commodities and perishables. It also contributes to the literature on intermediaries in agricultural markets and finds that in the absence of sound infrastructure, intermediaries become indispensable to the farmers. Although there is clear evidence of intermediaries exploiting the farmers by charging higher than prescribed commission rates and paying them less for their produce, they are indispensable to farmers when the farmers do not have easy access to markets, warehousing and processing infrastructure and institutional credit. Policy implications of the paper include an urgent need to develop storage and food-processing infrastructure that will be as helpful to the farmers as the roads that help in improving market accessibility. Also, the paper suggests that mere ICT tools such as cell phones can do little to increase farmers' profits, if not done in conjunction with an improvement in credit-lending and agricultural marketing institutions.