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Effect of Assured Transit Time for Perishable Farm Produce on Enhancing Farmers' Income: A Case Study of *Kisan Rail* in Context of *Mann Ki Baat*

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ABSTRACT

Transporting the farmers' produce from field to market in shortest possible time has great potential to curtail farmers' risk on net profit. Keeping this in view, the Government of India took initiative to operationalize *Kisan Rail* in August 2020 to fill this gap. The initiative got a fillip through its elaboration in a radio program named *Man Ki Baat*. The study aimed to answer the research question whether the *Mann Ki Baat* episode had effect on framers' knowledge and decision to avail the rail services. Applying a case study approach, the study was carried out in four states of India growing prominent fruit crops including grapes, guava, pomegranate and mango and transporting the produce by Kisan Rail from the site of production to distant places. The respondents selected for the study comprised of 8 groups of 20-25 farmers each. Thus, the total sample size for all the four fruit crops included was 200 respondents. The data were collected using personal interviews and Focus Group Discussions and were analyzed using descriptive statistics. The results showed that an appreciable number of farmers got sensitized, and mobilized to avail the services of *Kisan Rail* after 77th episode of '*Mann Ki Baat*' (aired on 30th May, 2021). With increasing probability of getting benefits through access of '*Kisan Rail*', farmers perceived that the risk percentage of perishable agro-produce got minimized. Grape grower farmers from Nasik (Maharashtra)earned a net profit of Rs. 70.0 Lakh by supplying 22.2 thousand quintal by using *Kisan Rail*. Whereas, pomegranate farmers of Solapur (Maharashtra) supplied 2.0 thousand quintals of pomegranate and earned a net profit of Rs. 5.40 Lakh. From Raipur, farmers' group transported 0.54 thousand quintals of guava and earned the net profit of Rs. 0.54 Lakh. The highest net profit of Rs. 28000/ q was secured by mango transportation (2.50 th.q) by a group of farmers from Chikkaballapur (Karnataka). The study suggests that kisan rail facilitated the transport of farmers' produce from one place to another, secured higher net profit, and minimized the losses, and reduced the involvement of middleman.

INTRODUCTION

India has achieved impressive growth since independence in terms of production of food grains (315 MMT during 2022), fruits and vegetables (342 MMT during 2022) and production of milk (220 million tonnes in 2022) (https://www.timesnownews.com/india/economic-survey-2022-23). However, these indicators do not lead to similar growth in the income of the farmers. Taking away the effect of inflation, real farm income just doubled during past

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22 years i.e., 1993-94 & 2015-16 (Chand, 2017). This probably happened as the focus of the government was mainly on raising agricultural output and improving food security rather on farmer's income and welfare. At the same time, India's contribution to wasted food, at 68.8 million tonnes annually, is 7 per cent of the global total and approximately 10 per cent of total food grains (16%) and fruits & vegetable production (15-30%) combined together at national, as estimated by United Nations Environment Programme (Anon, 2022; Food Waste Index Report 2021).

These situations have ignited the policy institutions for seeking the alternatives for increasing farmers' income by adopting the 7-steps model (including technological, market related and policy based measures) as suggested by NITI Ayog of India (https://www.niti.gov.in/indian-agriculture-towards-2030) and therefore, the government is having its focus on farmer's welfare and income enhancement. Resultantly, the Government of India has focused its attention on doubling the farmers' income during the seven-year period from 2015–16 to 2022–23, marking a significant departure from past policies of emphasis only on production rather than the marketability of the produce and there has been such successful cases documented by ICAR (https://www.ncaer.org/project/doubling-farmers-income).

'In the entire process of farmers' income enhancement, agricultural marketing is most significant one that starts with a decision to produce a saleable farm commodity, involving all the aspects of market structure or system, both financial and institutional, based on technical and economic considerations, and includes pre- and post-harvest operations, assembling, grading, storage, transportation and distribution (National Commission on Agriculture, 1976; Acharya & Agarwal, 2011; Singh et al., 2012; Das et al., 2015). Distance to markets is also important; as an increasing distance to the market increases the probability that the household sells their produce in the proximity. This is joined up with the existing means of transportation, infrastructure, and costs of logistic. With specific reference to Tanzania et al., (2013) categorically established that market access is an important aspect for farmers in raising incomes, reducing poverty, and improving their general welfare. Further, evidences suggest that the social and economic attributes of small farmers and their extent of market use indicate that farmers having access to market outside the region were those who had agriculture as the main occupation and they were having small landholdings (Rajabu et al., 2020). The scholars have also established that if farmers have group attributes and affiliation to any organization, the possibility of marketing their produce outside the region is magnified and ultimately the transactional costs (Raina et al., 2011; Parthiban et al., 2015; Kumari et al., 2022).

The case studies done in Asian countries further revealed that, markets and storage facilities were on an average closer to villages than in the African countries (Hine & Ellis, 2002). In addition, farmers were more able to sell their produce at those markets. In Ghana, the multitude of middlemen that were involved in the marketing process means that even if a farmer is able to get to a market; he may not have the facilities or contacts needed to sell his/her produce at reasonable prices. Thus, the lack of faster and timely transportation facilities implicated farmers to take lower prices rather than risk not being able to sell their produce in distant places. Mechanized transport methods can improve the efficiency of on-farm agricultural transports by reducing the transport costs and time. The effects on agricultural production can be manifested manifold in the form of deploying larger area under cultivation, reduction of transport time, which could be partly used for income generation, reduced effort and drudgery involved in human porterage; and spill-over effects in mechanization of farm operations and transporting the produces. Retail market shall be another important component in marketing of agri-produce. Retail market is estimated to reach USD 1.6 trillion by 2026, registering a CAGR of approximately 10 percent. Share of organised retail will likely increase to 22–25 per cent in 2022 from 12 percent in 2017 (Baskar & Salender, 2022).

Genesis and operationalization of Kisan Rail

The arguments discernibly reveal that farmers, especially small and marginal farmers, often find it difficult to sell their produce in markets beyond a certain distance, primarily due to factors such as non-availability of affordable transport (Das et al., 2014), delay in transit resulting in damage/decay to produce, and unwillingness of road transporters to carry small sized consignments. In order to overcome such hurdles, which have been preventing small and marginal farmers from reaching larger markets, an announcement was made in the Union Budget 2020-21 regarding Indian Railways to set up a *Kisan Rail* for transportation of perishables, inclusive of milk, meat and fish (https://indianrailways.gov.in/ railwayboard/uploads/directorate/Secretary_branches/Reforms/Kisan%20Rail%20-%20A%20Boon%20for%20Farmers.pdf). The idea behind running *Kisan Rail* services is to move perishables agri-products from production/ surplus regions to consumption or deficient regions, and speedy movement to ensure minimum damage during transit. *Kisan Rail* is a step to enable farmers to utilize the vast railway network to gain access to distant, bigger and more lucrative markets. Access to such markets will enable farmers to sell their produce at a better price, which will go a long way in fulfilling Government's vision of 'doubling farmers' income. *Kisan Rail* is an enabling factor for improvement in farmers' trade and real returns received by the farmers for their produce. The first Kisan Rail Service was flagged off between Devlali (Maharashtra) and Danapur (Bihar) on August 7 during 2020 by Hon'ble Minister for Railways and Hon'ble Minister for Agriculture and Farmers Welfare. Since the launch of *Kisan Rail* service on 7 August 2020 and upto 31 January 2023, Railways have operated around 2,359 *Kisan Rail* services, transporting approximately 7.9 lakh tonnes of perishables (PIB 2023). The prominent states include Andhra Pradesh (116 onward service), Maharashtra (1868 onward services), Gujarat (62), Uttar Pradesh (76), Madhya Pradesh (74) and West Bengal (44). Up to 31.3.2022, 50 per cent subsidy in freight was granted by Ministry of Food Processing Industries (MoFPI) for transportation of fruits and vegetables by *Kisan Rail*, which was not continued further. Thereafter, Railways have been continuing with the subsidy, at a rate of 45 per cent. This subsidy is presently applicable till 31 March 2023. During 2020-21, Railways disbursed Rs. 27.79 crore as subsidy which was reimbursed by MoFPI. During 2021-22, Railways disbursed Rs. 121.86 crores as

subsidy, out of which only Rs. 50 crores was reimbursed by MoFPI. During the current year up to 31.01.2023, Railways have disbursed Rs. 4 crore as subsidy (Anon, 2022). Apart from direct benefits the farmers had a mental peace also while growing perishable agro-produce because of assured transportation facility and marketing.

Therefore, the operationalization of *Kisan Rail* for last two and half years covering the vast railway network/route across the major states of India raises certain research questions like as to how magnitude of the major fruits are being transported using it, how the *kisan rail* benefitting small scale fruit growers in amplifying their income with lesser investment and how the experiences of *Kisan Rail* operation shall be a running institutional interventions in the benefits of agricultural farmers of India? The present case study may enable us to understand the perspectives of smallholder farmers on Kisan Rail that was discussed in *Mann Ki Baat* (episode number 77).

METHODOLOGY

The study followed case study method of investigation. Case study as a technique for presenting data is one of the oldest and important methods (Jocher, 1928) although perceptual mapping have potential (Gupta et al., 2021). The earliest applications of the case method to social research were the historians' descriptive accounts of peoples and nations, followed later by detailed studies of smaller groups, factions, and individuals (Anonymous, 1922). Case studies of contem porary groups and individuals were a later development (Bernard, 1927).

In the common parlance, transport costs are taken as the only variable that varies per unit of distance covered often maximum for bulky and/or perishable items such as timber and dairy products. This has inferences on declining of the production unit if it is away from the market point according to the 'Distance Decay Model', but the rate of decline differs by commodity as hypothesized by von Thünen (1985).

As fruit crops are more perishable, analyzing the case of four major fruits like grapes, pomegranate, mango and guava covering the four major districts namely Nasik and Solapur from Maharashtra, Raipur and Chikkaballpura from Chhattisgarh and Karnataka, were opted respectively. The large proportion of small farmers (75% and more) in these three states were the major criterion for their purposive selection. The two types of data viz. primary data from the groups of farmers cultivating these crops; and secondary data (the monthly details of these selected four fruit crops transported from the identified district railway station using Kisan Rail) were procured from railway official records for the period of August 2020 to March 2023. Researchers interacted with a set of key sampled farmers in a group (usually comprising 20-25 farmers per group). Thus, the sample size for all the four fruit crops included 200 farmers as respondents representing eight groups, who were interacted using the checklist devised for the purpose.

Mainly physical mapping, transportation related indicators and economic parameters were utilized for the study. Physical mapping included the names of farmers' led group or business organization, their membership strength and total area (acre) actually under cultivation of that crop by the given group members. Likewise, transportation related parameters included quantity of the produce transported (q), their total commercial value as per the standard norms adopted by the *Kisan Rail* (lakh Rs.), number of farmers groups availed this facility for the given crop and the subsidy given by the *Kisan Rail* (lakh Rs.). The major economic indicators included the net profit earned by the group as a whole (lakh Rs) as well as individual farmer (Rs/q). The collected data were subjected for descriptive statistics using mean and unit value to draw the meaningful inferences from this study.

RESULTS AND DISCUSSION

Major fruits transported through *Kisan Rail* during 2020-23 were grapes, pomegranate, guava and mango from Nashik, Solapur, Raipur and Chikkaballpura, respectively (Table 1).

Grapes

Nashik is the leading grape producer in the country and also known as grape capital of India producing about10 lakh tonne grapes from 1.75 lakh ha with a productivity about 20 tonne/ha. It was learned that total 10 farmers group transported 35 q grapes valued Rs. 110 lakh and a subsidy of Rs. 70 lakh was provided by the government for transportation of 35 q grapes from Nasik (Maharashtra) (Table 1). The survey results revealed that 15,000 farmers covering 15000 acre of area under grapes cultivation associated with Shayadri Farm Supply Chain Limited group supplied 22.2 thousand quintal grapes. They have earned a net profit of Rs. 70.0 Lakh from this supply (Table 2 &3). *Kisan Rail* levied charges of Rs. 400/q for transportation, subsidy was Rs 200/q and net profit of Rs 5000/- per quintal was attained by availing *Kisan Rail* facility from Nasik (Maharashtra) (Table 3).

Table 1. Details of different fruits transported through Kisan Rail in major states of India during 2020-23

State	District	Fruit crops	Transportation parameter			
			Quantity transported (q. th.)	Total value (Lakh Rs.)	Number of farmer groups availed this facility	Subsidy given by Kisan Rail (Lakh Rs.)
Maharashtra	Nasik	Grapes	35.00	110.00	10	70.00
	Solapur	Pomegranate	19.20	63.31	05	32.50
Chhattisgarh	Raipur	Guava	5.30	2.70	Aggregator	0.14
Karnataka	Chikkaballpur	Mango	2.50	0.40	04	0.20

Source: Secondary data collected from railway officials for Kisan Rail Service

Table 2. Physical mapping of promising horticultural produces being transported using *Kisan Rail* in India

State	District	Crops	Major operating Farmers Group	No. of farmer members associated	Area covered (Acre)
Maharashtra	Nasik	Grapes	Sahayadri Farm supply chain limited	15,000	15,000
	Solapur	Pomegranate	Mahesh Annada Bandgar	100	96.00
Chhattisgarh	Raipur	Guava	By aggregator	10	10.00
Karnataka	Chikkaballpur	Mango (Alphonso)	Maavu Belagara Sangh	25	136.00

Source: Authors' survey based findings

Table 3. Economic analysis of promising horticultural produces being transported in the selected states of India

State	District	Crops	Total Quantity Transported (th. q)	Charges of Kisan Rail (Rs./q)	Subsidy (Rs./q)	Net profit earned (Lakh Rs.)	Net profit earned per farmer (Rs./q)
Maharashtra	Nasik	Grapes	22.2	400	200	70.00	5000(Rs. 50/kg)
	Solapur	Pomegranate	2.00	540	270	05.40	5625(Rs. 56/kg)
Chhattisgarh	Raipur	Guava	0.54	203	101	00.54	2727(Rs. 27.27/kg)
Karnataka	Chikkaballapur	Mango(Alphonso)	1.25	560	280	7.0	28000(Rs. 280/kg)

Source: Authors' survey based findings

Pomegranate

Nashik in Maharashtra is a major pomegranate growing district with an area of 0.5 lakh ha and production is 6.79 lakh MT, followed by Solapur district (area: 0.2 lakh ha; production: 1.69 lakh MT) with average productivity of 50 q/ha (Kharat et al., 2019). Total 5 farmers group transported a total of 19.2 q pomegranate valued Rs 63.31 lakh, and a subsidy of Rs 32.50 lakh was provided by the Govt. for transportation of 19.20 q pomegranate from Solapur (Table 1). The survey results revealed that 100 farmers covering 96 acre area under pomegranate cultivation associated with *Mahesh Annada Bandgar* group. This group has supplied 2.0 thousand quintal pomegranate and could earn net profit of Rs. 5.40 Lakh (Table 2 &3). Kisan Rail levied charges of Rs. 540/q for transportation, subsidy was Rs. 270/q and net profit of Rs. 5625 per quintal was attained by pomegranate farmers by availing *Kisan Rail* facility from Solapur (Table 3).

Guava

Farmers of Chhattisgarh have been gaining increased income from guava cultivation that resulted in increasing the area (47%) and production (67%). Raipur district is one of the major guava producing districts in the state which produces7403 metric tonnes of guava (https://timesofindia.indiatimes.com/city/raipur/). Aggregators from Raipur (Chhattisgarh) transported 5.30 thousand q guava valued Rs. 2.70 lakh, and a subsidy of Rs 0.14 lakh was provided by the Govt for transportation of guava from Raipur (Table 1). Data analysis exhibited that group of 10 farmers covering 10 acre area under guava cultivation associated with aggregators group supplied 0.54 thousand quintals of guava. They could earn a net profit of Rs. 0.54 Lakh (Table 2 &3). Kisan Rail levied charges of Rs. 203/q for transportation; subsidy was Rs. 101 per q and net profit of Rs. 2727 per quintal was attained by guava farmers from availing Kisan Rail facility from Raipur (Chhattisgarh) (Table 3). During conversation with farmers, one of them had narrated the benefits of *Kisan Rail* facilitated with *Mann Ki Baat* was as:

"Pradhan Mantri jee ke bahut bahut dhanyavad. 2021 mein ham radio pe Mann ki Baat me sunae ke tarkaree (sabjee) aur doodh khatir ego train kisan ke khatir chalat bate, hum auree kisan logun se baat kar ke aapna sabjeee kae kissan rail se bhejal suru kainee je se hamar sabjee khrab hokhe se bache lagal, mandi ke bichouliyan se bhee chhut milal aur munaf a bhee badh gayeel (Expression of a farmer)

This local perception of farmer indicated that how enabling environment being created through *Kisan Rail* and facilitated by mass media messages (*Mann Ki Baat* by Hon'ble PM) can make a significant change in curtailing the farmers' risks in terms of losses incurred on perishable items.

Mango

Chikkaballapur (Karnataka) is known for early harvest of mango in Karnataka and farmers are fetching good prices for growing different varieties of mango such as Alphonso, Banganapalle, Imam Pasand, Senthoora, Kesar, Mallika etc. (https://www.thehindu.com/news/national/karnataka/). Total area covered by Mango crop in Chikkaballapur is about 0.46 lakh ha producing 3.7 lakh MT mango with a productivity of 80 q/ha (Chandra et al., 2020). Total four farmers groups transported 1.25 thousand q mango valued Rs 0.40 lakh and a subsidy of Rs 0.20 lakh was provided by the government for transportation of mango from Chikkaballapur (Karnataka) (Table 1). Observation indicated that 25 farmers covering 136acre area under mango cultivation associated with Maavu Belagara Sangh group supplied 1.25 quintal mango, and were able to earn net profit of Rs. 7.0 lakh (Table 2 &3). *Kisan Rail* levied charges of Rs. 560 per q for transportation, and subsidy was received for Rs. 280 per q. There was net profit of Rs. 28000/q by the mango farmers by availing Kisan Rail facility from Chikkaballapur (Table 3). The value chain analysis of pulses also showed that transportation cost has the share

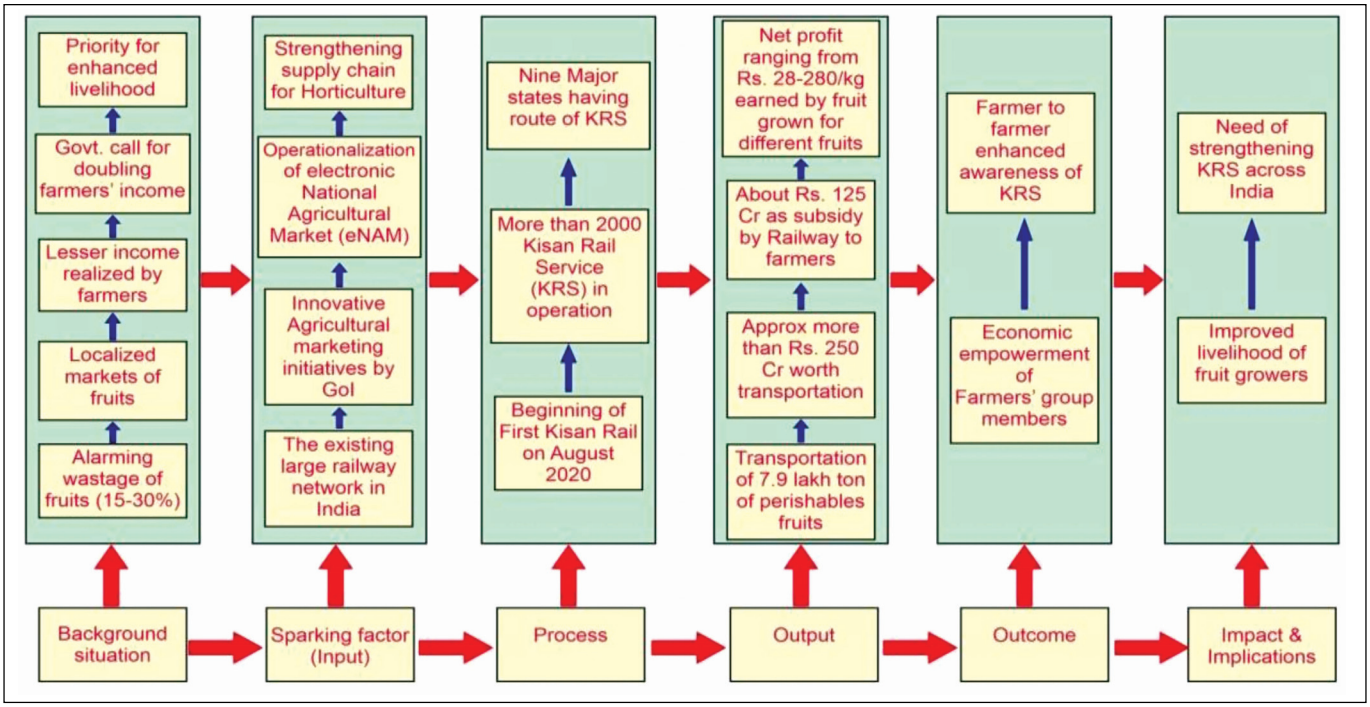

Figure 1. Result Framework of Kisan Rail for transporting the major fruit crops across India

of 15-18 per cent of the total cost (Sah et al., 2022) and also the scenarios analysis of pulses in Bundelkhand region aptly highlighted the issue of marketing of produce from the actual site to its desired destination (Sah et al., 2021), and if Government has support in transportation as being done by *Kisan Rail*, shall have far reaching implications. Based on such insights of success noted from four fruit crops, a result framework of *Kisan Rail* service for transportation of major fruit crops has been illustrated as in Figure 1.

CONCLUSION

Kisan Rail provide a seamless and cost-effective mode of transportation for farmers, enabling them to access larger markets for assured marketing of their produce and fetching better prices. It also helps in reducing wastage by ensuring the timely delivery of perishable goods. Findings of the study helped to understand how *Mann Ki Baat* sensitized the farmers that *Kisan Rail* service is instrumental for distant placement of perishable fruits timely and in safest mode to consumers as well as agribusiness processing industries. The fruit growers' net income has been also proved to be doubled (150-200%) using *Kisan Rail* service as compared to those who sold otherwise. The benefits of *Kisan Rail* are manifold including a reliable and efficient transportation system for farmers to transport their produce, which helps them in accessing new markets and earning higher profits. The refrigerated coaches ensure the quality and freshness of the produce, reducing wastage and increasing the value of the goods. In summary, *Kisan Rail* is a beneficial initiative that aims to help institutionalization of farmers group through assured transportation and marketing of perishable agri-produce reducing wastage and promoting economic growth and negate the hypothesis of distance decay model.

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