

# Small but Sustainable – Applying PGS to strengthen farmer’s opportunity of earning in fruits and vegetables supply chain- A Conceptual Framework

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## Abstract

*Sustainability of business is a major concern for businesses across world. This concern is inevitable for agriculture sector also- horticulture sector not to be excluded. Horticulture crops are seen as high value crops which help in increasing farmer’s income. But the present scenario of market and supply chain of horticulture crops- particularly fruits and vegetables is functioning on age old ways and is highly inefficient in terms of profit sharing between value chain partners.*

*This paper tries to identify the problem in the value chain of vegetables and fruits. It further attempts to propose a model to strengthen the situation of farmers of fruits and vegetables-particularly small farmers selling in domestic markets. The PGS based model is expected to improve market efficiency in general.*

*Key Words : Food Supply Chain, Vegetables and Fruits, Participatory Guarantee System(PGS)*

## 1. Background

Year 2015 was a critical political and diplomatic milestone: the member states of the United Nations signed a new agenda for development, with the 17 Sustainable Development Goals (SDGs) placing sustainability at the core of international efforts. Development and academic actors are since then exploring new avenues for translating the SDGs into reality and implementing global and local frameworks and partnerships.

The SDG is a matter of interest in the agriculture sector in India as it has seen several ups and downs in the past years. 58% of the country’s population is earning its livelihood from agriculture and it contributes around 16% to the country’s GDP. Moreover, India is the largest producer of several agricultural produces and second largest producer of horticulture crops like beans, cabbages, onions, potatoes etc (Sector Profile, 2016). The rising income levels and increasing urbanisation has given a boost to the domestic food consumption industry as well.

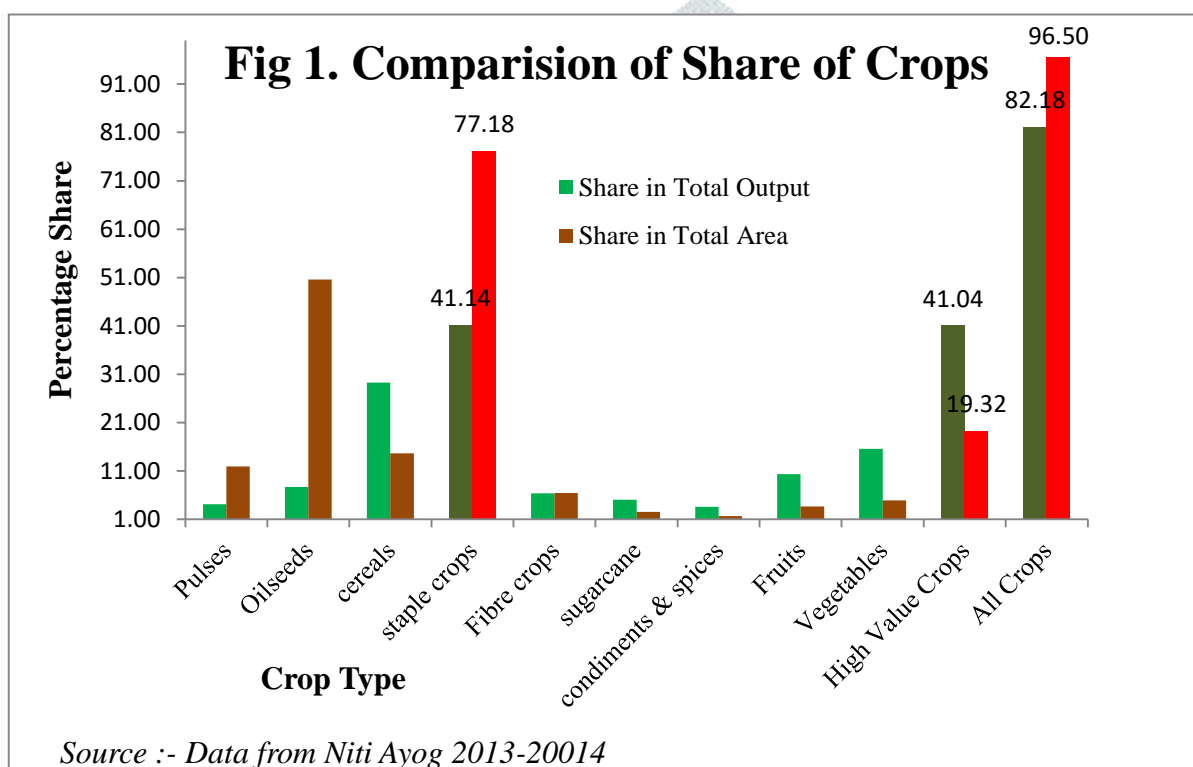
The above information makes it clear that agriculture and its sustainability is at the centre stage in terms of policy. Nation’s policy for the sector has primarily focused on two dimensions – increasing productivity and improving food security. The present government has laid out the vision for doubling farmer’s income till 2022-23. The policy paper by (Chand, 2017) suggests that doubling the real income of farmers in this stipulated time requires 10.41% annual growth in farmer’s income. It suggests a list of measures which might accelerate the growth operating within agriculture sector. Improvement in productivity, resource use efficiency or saving cost of production, increasing cropping intensity, diversification towards high value crops are a few to name. Shifting cultivators from farm to non-farm activities and improvement of prices received are yet another measures suggested by the policy document.

Given this emphasis on the sector, its challenges and need to identify ways to enhance farmer’s income, it is the call of the day to explore newer methods to achieve the objective.

Can horticulture crops (High value crops) be an area of focus for achieving this objective? A look at figure 1 shows that the high value crops which include fruits and vegetables occupy an area of 19.32% of total cultivated land in the country as against 77% land occupied by staple crops like pulses, cereals etc. But the horticulture crops contribute 41.04% of output as against 41.14% contribution of staple crops. The current estimates confirm this as production of horticulture crops is estimated at record 307.16 million tonnes (mt) in 2017-18, 5.5% higher than previous year. (Sector Profile, 2016)

Thus, horticulture crops are being viewed as a prominent source of increasing the farmer’s income.

Figure 1 – Comparison of Share of Crops



While the government has identified this prospect and has started shifting the focus of industry to this sector, it is aware of the challenges in this sector. Marketing of fruits and vegetables is biggest challenge owing to perishability of crops, small land holdings of farmers, middlemen dominance and lack of proper infrastructure. The XII plan report (Agriculture Division, 2011) identified the need to bring reforms in Agricultural Marketing. It emphasized the need to empower producers with knowledge, information & capability to undertake market-driven production, provide multiple choice and competitive marketing Channels to farmers and attracting large scale investments needed for building post-harvest infrastructure as the areas where policy needs to be focused.

Agricultural value chains form spaces where local and global challenges to sustainability connect and this is the area where much needs to be done. Most of the policy measures have ignored this aspect.

## 2. Marketing System of Fruits and Vegetables in India – current scenario and policy measures

In India, farmers’ produce is generally disposed off in the village, rural / primary market or secondary agricultural market. According to XII plan report on fruits and vegetables (Agriculture Division, 2011), the number of regulated (secondary) agricultural markets stood at 7,157 as of March 2010 as compared to just 286 in 1950. There were also about 22,221 rural periodical markets, about 15 per cent of which function under the ambit of regulation.

Average area served by a market is 115 sq. km while an average area served by a regulated market is 454 sq.km. According to recommendations by National Farmers Commission, availability of Markets should be within 5 km radius (approx. 80 sq km) (2004). Not only the distance to markets is large, but a look at the supply chain of vegetables and fruits indicates the poor state of affairs at all levels. Dominance by middle men, farmers with small land holdings, very small lot size of the product, perishability, poor infrastructure are some of the prevailing issues which have contributed to inefficiencies in the value chain of vegetables and fruits.

Linking of farmers to consumer was identified as the key focus area in the XII plan. The policy of government is based on the basic principle of extending help to smallholder agriculture and disadvantaged producer groups. The XII plan aimed at improving the terms of trade of small producers with the market, addressing the risks faced by small producers and help to reduce them. It recognized the importance of small producers in the value chain and the need to facilitating their inclusion in the wider economy so that producers further move up the value chain to increase

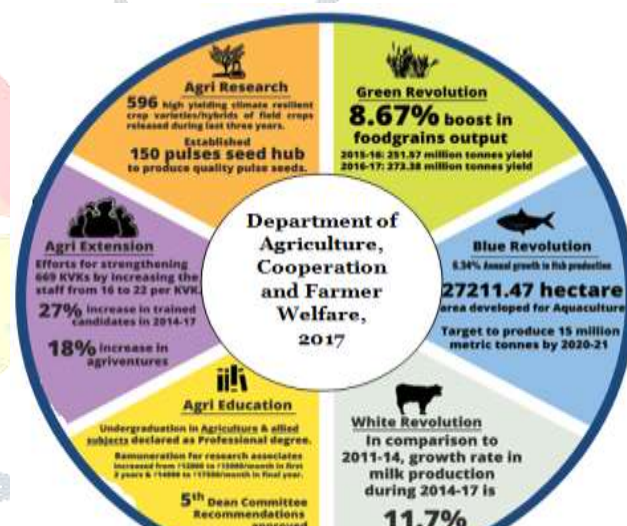
Figure 2 – Recent efforts in agriculture in India

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returns on investment and their economic security.

### 2.1 Review of efforts by Government –

The department of agriculture, cooperation and farmer welfare published a report (Report, 2017) to summarize efforts and accomplishments of each state during the three years of present government. A review of the report shows that the government has done substantial efforts in agriculture and the results are showing. The agriculture sector recorded growth of 4.6% and has contributed 15.4 % to GDP in the year 2016-2017 (Department of Agriculture, 2017-2018).



Source 1- (Report, 2017)

Steps have been taken to improve soil fertility on a sustainable basis through the soil health-card scheme, to provide improved access to irrigation and enhanced water efficiency through Pradhan Mantri Krishi Sinchai Yojana (PMKSY), to support organic farming through Paramparagat Krishi Vikas Yojana (PKVY) and to support for creation of a unified national agriculture market to boost the income of farmers. Further, to mitigate risk in agriculture sector a new scheme “Pradhan Mantri Fasal Bima Yojana (PMFBY) has been launched for implementation from Kharif 2016.

### 2.2 Review of Efforts in Horticulture

Mission for Integrated Development of Horticulture (MIDH) is the key agency which cares for all horticulture related activities in India from 2014 onwards. It subsumes agencies (i) National Horticulture Mission (NHM), (ii) Horticulture Mission for North East and Himalayan States (HMNEH), (iii) National Bamboo Mission (NBM), (iv)

National Horticulture Board (NHB), (v) Coconut Development Board (CDB), (vi) Central Institute of Horticulture (CIH), Nagaland.

As a result of conscious efforts and interventions in horticulture in the country, there has been an increase per capita availability of fruits from 158 gm/person/day in 2007-08 to 201 gm/person/day in 2016-17. Similarly, per capita availability of vegetables has increased from 309 gm/person/day in 2007-08 to 385 gm/person/day in 2016-17 (Source (Department of Agriculture, 2017-2018). This indicates increase in supply of fruits and vegetables.

The National Horticulture Board (NHB) established in the year 1984 by the Government of India for creation of production hubs for commercial horticulture development, post harvest infrastructure and cold chain facilities, promotion of new crops, and promotion of growers' associations.

The National Horticulture Board has worked on four areas as follows –

- Development of Commercial Horticulture through Production and Post Harvest Management
- Capital Investment subsidy scheme for construction/ expansion/ modernization of cold storages for Horticulture Produce
- Technology Development and Transfer for Promotion of Horticulture
- Market Information Service for Horticulture Crops. Coverage of markets by NHB shall be increased from present 36 fruits and vegetables markets to 50 markets.

While all these efforts of the government are most desired and welcome. But there is certainly an area which is being missed out in this policy measures. And that is establishing appropriate and robust system of linkages between farmer and consumer. XII plan recommendations seem to have lost the state and central government's attention on these lines.

In a time when the nation is looking up to building up efforts for "Doubling Farmer's Income" (Chand, 2017) it is essential to understand that formal value chains can deliver same product, usually in better or more uniform quality. It is detrimental to find ways to integrate small producers into more modern value chains, both domestic and export oriented.

Keeping this in mind, the next section of paper proposes a model of "Participatory Guarantee System PGS) as a solution to integrating small farmer groups and establishing a direct linkage with consumer.

### **3. Small Famers of fruits and vegetables - Yet a neglected group**

#### **3.1 Case Study of Radheshyam**

Let us shift attention to a small, yet representative segment of India- Indore District of Madhya Pradesh, which is the industrial capital of the state, an education hub with a population of more than 25 lakhs. Indore has emerged as a prominent Tier II city which has attracted business in all facets ranging from infrastructure, IT, education, retail and several others. Retail majors like Big Bazaar, More, Best Prize etc are still bullish on the Indore consumer owing to increasing disposable incomes and changing lifestyles.

Everything in Indore has changed over past two decades – ranging from shopping malls, consumer buying behavior, expanding urban landscape etc. But what has not changed is the way small farmers sell vegetables and fruits to local markets through agents and wholesalers and retailers. Bulk of the produce is sold by farmers in raw form in the mandis after harvest. The farmer brings his produce to mandi and is dependent upon the agent for price fixing and weighing of the crop. The agent decides the price on some criteria which is purely based on his gut feel and has no scientific backing of price discovery mechanism. The farmer is not in a position to bargain because of the small lot size, lack of market information and fear of loss of crop with time. So, the farmer is left with no choice but to sell his crop at throwaway price. The following cost breakup shows that on many trades, the farmer is not even able to

recover his cost of production. To add to the misery, there is so far no mechanism of MSP in case of fruits and vegetables.

The following case study of selling watermelons in Choithram Mandi in Indore will help us clearly identify the problem -

**Table 1 - Farmer under Study - Radheshyam Patidar, Vasudha Farms**

Watermelon Area	1 Acre
Total Production	15 ton
Total Days	75
Person's Engaged in Farming	1Farmer +10 labour

Farmer Radheshyam Patidar planted watermelon on 1 acre of land in January 2018. After about 75days of nurturing and caring by him and 10 hired farm labour, he was able to harvest 15 tons of juicy red good quality watermelon. He took his crop in a tractor trolley to choithram mandi in Indore, which is around 120 kms from his farm.

Radheshyam reaches there at 5 am in the morning. He waits for the agent who is expected around 6 am. Radheshyam has done mental calculations and has taken an estimate of prices of

watermelon on previous days. He hopes to get around 8 to 10 rupees per kg rate for his crop (value between Rs1.2 lakhs to Rs 1.5 lakhs). Around 6 am few trucks arrive from Karnataka with 500 tonnes of watermelon. This suddenly changes the scenario. Because of this sudden increase in supply of watermelons, Radheshyam get's worried as his lot size is comparatively small and there is no branding on his product to differentiate his watermelon from other watermelons. Moreover he cannot afford to take his produce somewhere else as it will add to his cost. There is no other farmer from his village who is selling watermelon in this mandi on this day. He decides to sell it at whatever price he gets. He gets hold of an agent and sells 15 tonnes of his watermelon at Rs 5 per Kg (Total value Table 2 and figures 3 and 5 summarize his cost profit analysis.

**Table 2 - Cost Profit Analysis for Watermelon crop on 1 acre of land for 75 days (Based on primary data collected from farmer, agent, wholesaler and retailers)**

Value chain Member	Selling Price Per KG	Total Production (Kg)	Profit Per Kg	Gross Profit (GP)	% GP	Total Persons Involved	Total Days of involvement	Total Man Days Spent	Profit Per Person Per Day (Rs)	Percent age share in Profit
Farmer	5	15000	2*	30000	10	1	20	20	1500	<b>1.93</b>
Agent	7	15000	2	30000	10	1	1	1	30000	<b>38.59</b>
Wholesaler	10	15000	3	45000	15	1	1	1	45000	<b>57.88</b>
Retailer	20	15000	10	150000	50	120	1	120**	1250	<b>1.61</b>
Total Sale Value	RS 3,00,000								77,750	<b>100.0</b>

\* Based on information provided by farmer ,Cost of Production is Rs 3 per kg

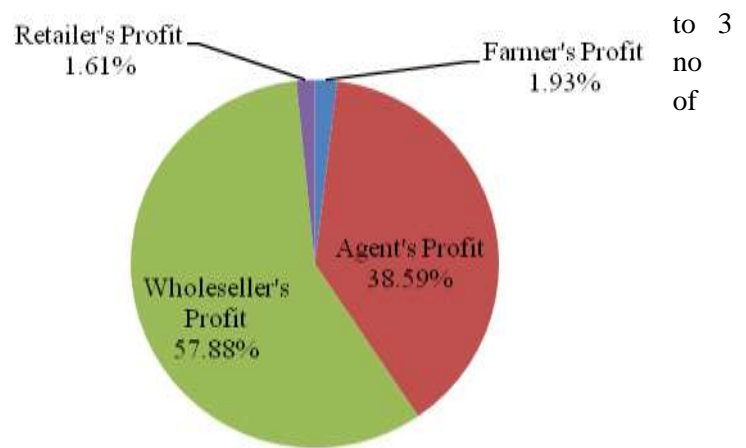
\*\* Assuming 1 small retailer sells 5 fruits weighing 25 kg watermelon per day

\*\*\* Cost involved for value chain members other than farmer not included assuming it to be substantially low

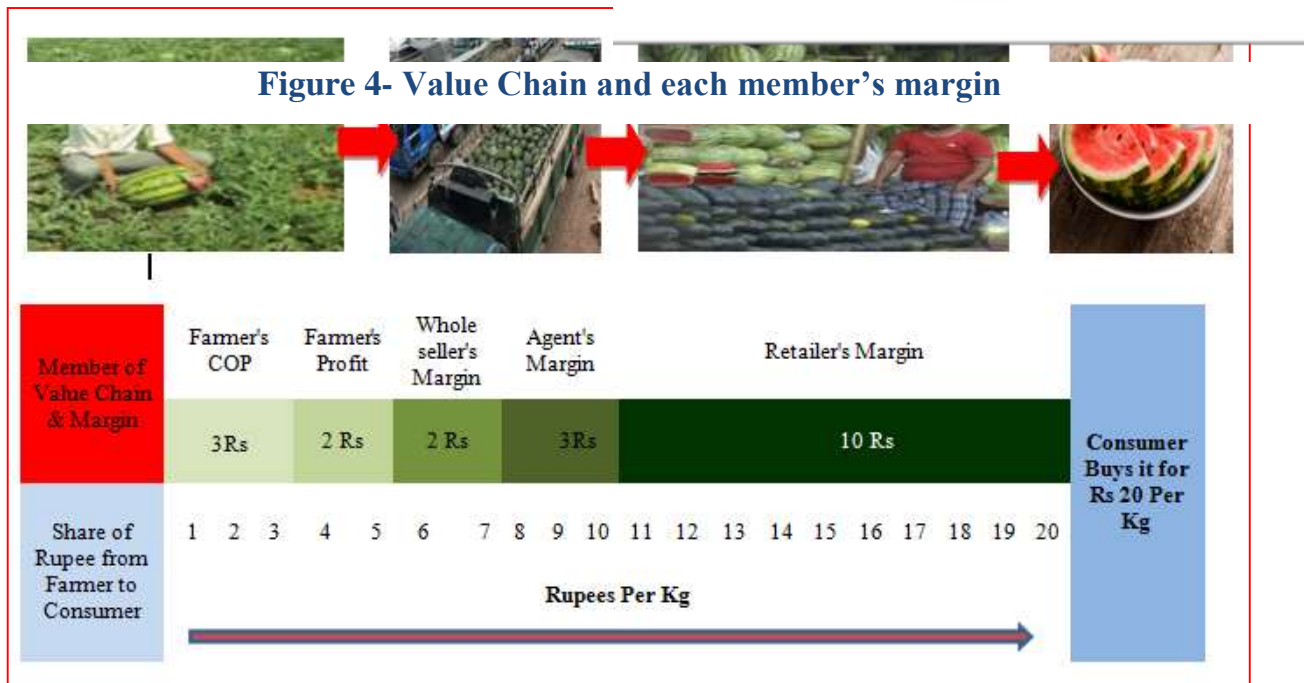
The table shows that farmer spends around 20 man days to nurture his crop (total crop duration is 75 days) and earns only 1.93% per day. While the agent and the wholesalers earn the major chunk of 38.59% and 57.88% per person per day. The retailer earns very less owing to distribution of volume among more number of retailers. Another observation is in terms of value added to the produce. Farmer added the highest value in making the seed into fruit. Retailer added value in terms of logistics provided by him in carrying the fruit from mandi to customer. The

wholesaler added some value by storing it for 2 days if required. But the agent practically added value to the value chain and still earned 38.59% the profit share (Apart from making on spot cash payment).

This case study reflects the plight of farmers in horticulture crops. Particularly in domestic markets where markets are not yet technologically advanced.



**Figure 4- Value Chain and each member's margin**



What could Radheshyam have done to increase his share in the profit? Could he have done something to avoid the agents, wholesalers? Could he have done something like branding to differentiate his watermelon from the Karnataka watermelon which spoiled the prices? Could he have approached some other market? Was there any possibility of collaborating with some other producer to improve his bargaining power?

In short what choice does Radheshyam have to improve his position in the value chain from farmer to consumer?

#### 4.0 Alternate Value Chain Suggestions -

Several alternative marketing models were suggested under XII plan to meet this cause of strengthening the supply chains for small farmers particularly engaged in farming fruits and vegetables. These models are as follows :-

**Alternate Marketing Systems** - direct marketing, contract farming, direct linkage with Retailers/ Processors/ Exporters and market oriented production are some of the approaches which could help the farmers in reducing the length of value chain and shift the margins in favour of farmers.

**Government Initiatives-** Apni Mandis in Punjab, Rythu Bazaars in Andhra Pradesh, Uzhavar Santhai in Tamil Nadu, and Shetkari Bazaar in Maharashtra, promoted by state Agencies. Horticultural Producers' Coop. Marketing & Processing Society (HOPCOMS – a cooperative) in Karnataka and SAFAL F&V project of National Dairy Development Board (NDDDB) in Bangalore are some government initiatives for direct marketing by farmers.

**Producer Groups / Farmer Groups (PG / FG)** – Producers’ Associations (PAs) – Farmer Common Service Centers (FCSCs): Farmer Common Service Centers (FCSCs) are conceptually small scale commercially viable entities owned by Producers’ Associations (PAs). The FCSCs will support 250-300 members, through Producer Groups / Farmer Groups of around 12-19 active members in each Producer Groups (PGs). Around 15-20 PGs in a village or a group of villages can be formed within the radius of 3-5 Kms.

**Pledge Loan linked to Warehouse Development:** Availability of finance against stored produce and improved knowledge on price risk management allows farmers and farmers’ organizations to obtain better price realization for their produce.

**E-Trading:** The concept of E-trading or ‘Virtual Market’ is innovative and experimental. Virtual Markets for agricultural products are very much in their infancy but with new technological development, field results are undergoing significant revision and refinement.

These alternate options are being implemented by government in different proportions in different states. In Madhya Pradesh, the horticulture department has taken initiatives like PKVY, ATMA, PKVY, ATMA, SAMETI, BTT etc to improve the pre and post harvest management. But there is lack of steps taken to strengthen the value chain or to make the markets more efficient.

The private sector has also been attracted to this segment. Companies like Adani Fresh, Mahindra, Reliance Fresh etc have ventured into selling branded fruits. These companies mostly rely upon contract farming and market agents for procurement. They are charging premium for branding these products and making them sell into premium segment of markets. But how much of the premium is passed on to the farmer is a question mark?

They have created a market for branded fruits and vegetables which is good, but what is not good is that the farmer is still not a part of this profit making venture.

## 5.0 Can Participatory Guarantee Systems (PGS) Help Improve Value Chain Of Fruits And Vegetables?

Participatory Guarantee System is a mechanism to bring a group of farmers together, certify their produce on certain parameters and brand it and sell it collectively to the buyers. These buyers may vary from market to market. The PGS gives an advantage in terms of collective bargaining.

IFOAM (International Federation of Organic Agricultural Movements) defines **Participatory Guarantee Systems (PGS)**, as "locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange." They represent an alternative to third party certification especially adapted to local markets and short supply chains. They can also complement third party certification with a private label that brings additional guarantees and transparency. PGS enable the direct participation of producers, consumers and other stakeholders in the choice and definition of the standards, the development and implementation of certification procedures and the certification decisions

The IFOAM which is a leader in the concept of PGS at the international level, is running a program to recognize PGS in the organic sector. But PGS is a tool that need not be restricted to for organic agriculture but is useful in various sectors.

PGS is different from FPC (Farmer Producer Company). While an FPC is a group of farmers coming together for selling their produce. PGS is a certification system which is done by a peer group. It can be adopted by FPC or any other group of farmers who may get associated for business. Participatory Guarantee System is a process of certifying products which ensures agriculture production process in accordance with the standards laid down for organic products and that desired quality has been maintained. This is exhibited in the form of documented logo or a statement. PGS is a decentralized organic farming certification system aimed to promote domestic market growth and to enable small and marginal farmer so that have easy access to organic certification. It is cost effective, farmer- friendly and hassle-free. It is outside the framework of third party system of certification, which is a pre-requisite to enter export market of organic produce.

## 5.1 PGS improving supply chain in the world

There are examples from across the world where PGS has helped the farmers to come together, brand and certify their product, enhance marketable lot and thus get better value for their produce. Studies undertaken by (Matovu, 2016), (Robineau, 2016), (Ino, 2016), (Tran, 2016), (Truong, 2016) in different parts of the world like Vietnam, Argentina, Uganda and China have found that PGS has served to provide a direct guarantee, through the formation of a market, for sustainably produced food and agriculture products.

PGS has been found to strengthen farmers' innovations in strategic market negotiation, encourage communication and trust among farmers, intermediaries and consumers, starting in the field, improve public infrastructure for value chain logistics.

A study on PGS in Hanoi, Vietnam by (Cory William Whitney, 2014) suggests that PGS has helped the farmers of the region in several ways. The transition from individual plot management to cooperative land management assures better crop rotations, more reliable fallow periods, higher use of green manures, better and more reliable yields and higher quality and productivity overall among these small-scale producers. The management of collective groups is more comprehensive but, at the same time, easier. Retailers prefer the collective management scheme, find that the products are better, and the groups easier to do business with. Collective labor is a more effective and efficient way to go about doing the more labor-intensive work i.e. weeding and tilling, where the majority of the labor happens.

Thus, one may say that PGS is not only about certification, but it brings a lot of other benefits of collective farming and marketing of produce.

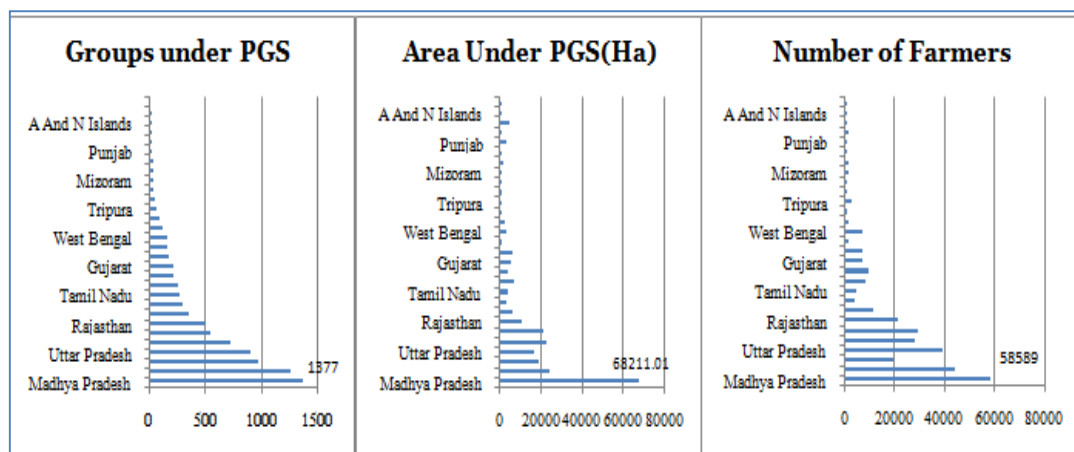
## 5.2 PGS in India

The Food and Agriculture Organization (FAO), IFOAM, and the Ministry of Agriculture in India initiated consultations with various stakeholders in 2005 to identify alternative certifications systems that are inclusive of the many small farmers and peasants in the country. The PGS Organic India Council was set up in 2006 as a result of these consultations. It functioned as an informal coalition of Voluntary Organizations or NGOs committed to the promotion of organic food production for domestic consumption in India, with export not being a priority at all. In April 2011, it was formally registered as a society in Goa as Participatory Guarantee Systems Organic Council (PGSOC). Many of the federal states within India have incorporated promotion of PGS for certification of organic produce in their state-level agriculture policies. At the national level, the National Centre of Organic Farming (NCOF) under the Ministry of Agriculture began to operate the PGS-India as a voluntary organic guarantee program with the PGS-National Advisory Committee as the apex decision making body.

In 2015, PGS scheme was launched in India by Department of Agriculture. It has proven to be a quality assurance initiative that is locally relevant with active participation of stakeholders including producers/farmers, traders and consumers in certification system. This group certification system is supported by Paramparagat Krishi Vikas Yojana (PKVY) scheme.

Figure 5- PGS in Indian States





Source 2-PGS India data 2018 ([www.pgsindia-ncof.gov.in](http://www.pgsindia-ncof.gov.in))

The figure 5 shows that comparative interest shown by different states in PGS. As seen, farmers of Madhya Pradesh have shown the maximum interest in PGS in terms of number of groups, area and number of farmers registered under PGS. This shows the acceptance and interest of farming community towards this innovative tool. So far, PGS has been used only for certifying organic crops. But PGS needs to be promoted for all crops –organic as well as chemically treated. The nature of certification may obviously vary for both.

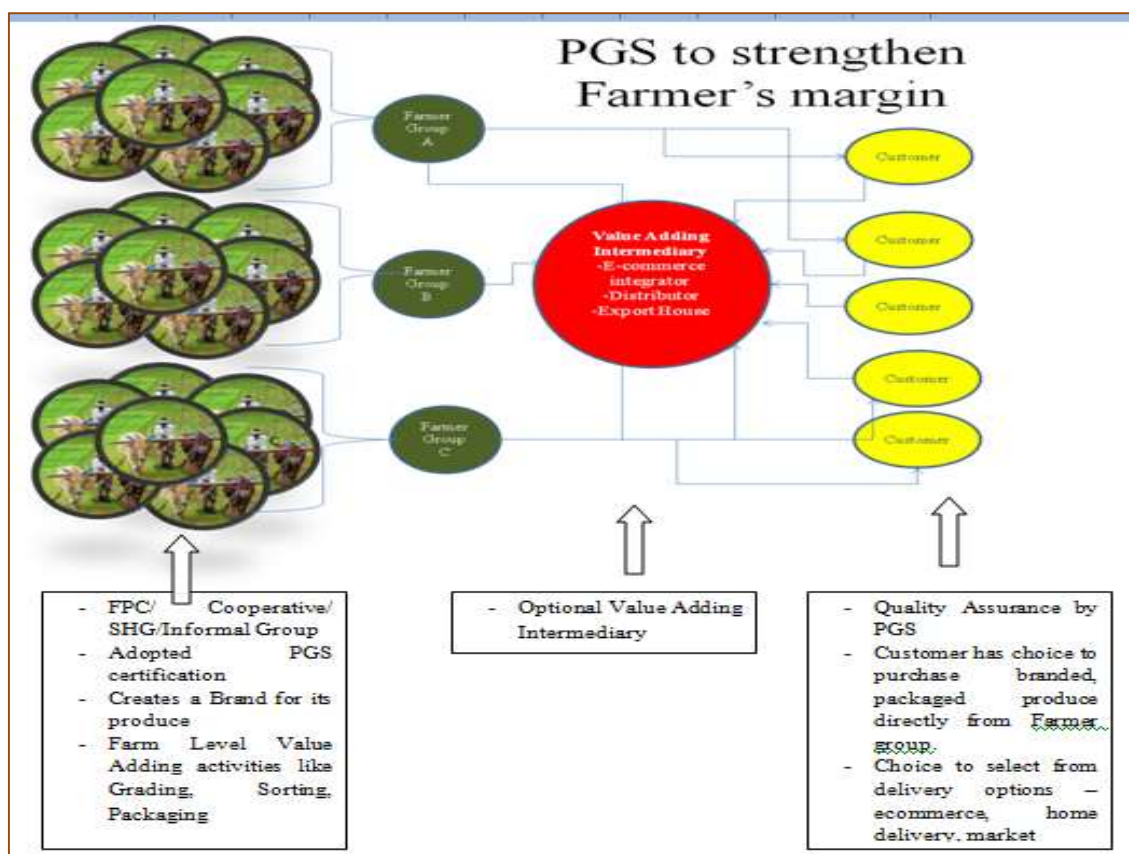
Farmers can collectively brand, package and sell the produce directly to consumer or to wholesalers. The PGS group can do collective bargaining by ensuring bulk volume of produce. This will enhance their margins. Further, PGS will enable the farmer groups to differentiate their branded produce from non branded produce. Branded produce is generally seen to fetch premium in the market as it assures quality to customer.

Let us coming back to Radheshyam problem and look at it again. If Radheshyam was a part of PGS certification system adopted by a group of farmers, then he would not have been left alone that day. He would have had more than 15tonnes of branded watermelon to sell. The branding of his watermelon would have fetched him more than what he got. And he would not have to be dependent on agent, he would have sold his branded watermelon to corporate houses or other bulk buyers.

### 5.3 Suggested PGS Integrated Model

The PGS model has already started gaining momentum among organic farmers in India. If introduced for farmers not yet involved in organic farming, it will help a larger segment of farming community to get benefited. The nature and terminology for organic and not organic certification may vary. Farmers can form groups which could be formal or informal. Formal groups could be self help groups (SHG), farmer producer company (FPC) or cooperatives. Informal groups could be any group of 5 to 8 farmers or more from a common village or community. They can develop a PGS system by defining parameters of quality and a commitment to deliver that quality. The commitment to deliver the quality will be key factor for the success of PGS as this commitment will help the group deliver a consistent quality and gain trust of buyers. The importance of issues like traceability of harmful pesticides can also be addressed through PGS. According to (Gale, 2006) control over processing and distribution channels through the traceability of ingredients and finished products is extremely desirable in modern supply chains. Large retailers and restaurant chains, such as Wal-Mart Stores and McDonald's Corp., are demanding traceability from their suppliers, and most processors are beginning to recognize that proof of traceability will soon be a minimum standard for doing business. This quality commitment can be translated in the form of a brand for the group.

Figure 6- Suggested PGS Integrated Model



Along with PGS certification, the farmer groups can add value to their brand by sorting, grading and packaging their produce. Once this is done, the farmer group will be in a position to command higher prices for their brand. They may now decide to go for a direct marketing or involve an intermediary who can add further value. It is important to understand that the intermediary proposed in this model is not a tradition agent or wholesaler. The intermediary has to be someone who brings some value to the process. The value may be in terms of e-commerce platform or logistic support or storage facility. Now, since the bargaining power will be with the farmers, the intermediary will not be able to exploit him and will remain in business only if it adds certain value. Moreover, the customer will also get benefited in many ways. He will get assured quality for vegetable or fruit from the farmer group. Customer will be aware of source of his product which will instill trust in the farmer group thereby further enhancing the brand value of the farmer group. Customer will also have choice to buy from market or get it home delivered, thus, adding to his convenience.

Thus, the PGS system is expected to be a win-win situation for both the farmer as well as the consumer.

## 6.0 Conclusion and Suggestions

India, being an agrarian economy, the sustainability of agriculture and allied activities is essential. There are efforts made by government at policy level in the past and it is expected to continue to do so in the coming years as it has developed the vision for doubling farmer's income by 2022. Horticulture crops –particularly fruits and vegetables have been identified to add higher value within small land holdings. Increasing disposable incomes have assured increased demand for fruits and vegetables particularly in urban markets. In order to make the farming of fruits and vegetables more profitable and sustainable for the farmer, it is essential to find ways to enhance supply chain solutions in domestic markets and improve market efficiency.

A PGS model along with collective farming is proposed to be one of the ways to improve profit margins for the farmer, improve the role of intermediaries and ensure value to customer. This model if adopted by farmers may help improve the benefits particularly for small farmers. This model may prove to be a game changer for the sector and help achieve the government's vision of doubling farmer's income by 2022.

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