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Peri-Urban Vegetable Cultivation in the NCR Delhi

NAAS

NATIONAL ACADEMY OF AGRICULTURAL SCIENCES, INDIA
July 2004

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Introduction

Peri-urban agriculture is recognised for its potential role in increasing food security, employment and income generation, poverty alleviation, community resource development, waste management and environmental sustainability. A large part of the world population is living in peri-urban areas. The rich social and economic variability of peri-urban areas offers opportunities for innovative science, living condition improvements and agricultural and ecosystem management requiring novel policies, and action to promote harmony both between society and nature and between groups of people.

The population of Delhi is around 1.4 crores which is causing phenomenal pressure on land, infrastructure and civic amenities. Availability of rail, road and air transport, cold storage, processing units, export houses and well established market network, will be helpful for taking up vegetable cultivation in peri-urban areas of Delhi in an organised way. Also, a huge quantity of solid waste generated during handling and marketing of fresh vegetable produce in NCR, Delhi, which is creating health and environmental hazards, can be used or recycled to produce vermicompost, etc., for use in organic vegetable production. Peri-urban vegetable cultivation can provide farmers the possibility to cultivate a small piece of land, and obtain an income to meet their essential and basic needs. In recent years, around big cities, green belts are being developed which can provide a very intensive and profitable network of small farms specialised in production of perishable vegetables for consumption by the urban consumers. This is likely to result in a social symbiosis between farmers and city dwellers with mutual benefits and advantages. This will require involvement of a large number of institutions to address many issues related to the peri-urban vegetable cultivation in a viable participatory approach to make an impact and deliver anticipated results to the peri-urban population.

Status

Delhi has five Community Development Blocks comprising 209 villages, of which, 199 villages are inhabited while the remaining 10 villages are uninhabited. Now-a-days about half of the NCR area is urban. The rural area of the NCR is divided into five Rural Development Blocks: Alipur (north), Kanjhawla (northwest), Najafgarh (southwest), Mehrauli (south) and Shahdara (east). Out of a total area of 1,47,448 ha, net sown area is 48,357 ha, *diara* land 7,000 ha, fallow land 12,886 ha, and cultivable waste land 10,850 ha. In addition, NCR Delhi has 74,248 ha non-agricultural land, 11,708 ha other uncultivated land, 1,561 ha forest land, 1,267 ha under tree crops and grooves. The total percentage of agricultural land comes to 41.7 per cent, 35 per cent of the total agricultural land is under vegetable cultivation. The annual collection of vegetables from Delhi farms is around 22 lakh tonnes. This is from around the periphery of the city from where men folk commute daily to the city and women attend to the needs of peri-urban vegetable cultivation. Major vegetables grown in and around Delhi include cauliflower, cabbage, carrot, spinach, mustard (leaves), cucurbits, okra, brinjal and tomato. In addition, culinary herbs such as fenugreek and coriander are also cultivated.

In NCR Delhi, 42 per cent landholdings are of up to 2 ha while rest (58 per cent) are of up to 3 ha. This size of holding suits best for development processes and technology

adoption. Approximately, 1 per cent of the urban and 17 per cent of the rural population is engaged in agriculture and adoption of vegetable cultivation is on a rise replacing cereal crops, due to its being more remunerative than other crops. As such, up to 35 per cent of land in some villages has gone under vegetable cultivation. Almost, all kinds of vegetables (tropical, subtropical and temperate) can be grown in Delhi farms, which is again an advantageous position. An important factor affecting both, land use and cropping patterns, is the access to transport networks for linkages with urban markets, labour and capital.

Resource Constraints

- Most of the farmers are ignorant about the quality of the seed material, its usefulness and availability. The improved high yielding varieties and hybrids have also not reached them due to either poor extension services or high cost. The quantity of such seed material available is also meagre. There is very little or sometimes no dissemination of advanced/improved production technologies including high-tech vegetable cultivation and off-season vegetable cultivation, probably due to lack of trained manpower/system.

- There is no awareness about low volume high value vegetable crops like broccoli, Chinese cabbage, asparagus, celery, parsley, leek, baby corn, cherry tomato, etc. and as such their demand by starred hotels and elite class is also only partially met with.

- Farmers are mostly ignorant of right stage of harvesting, proper cleaning, grading and packing of the produce, which results in low price for their produce. Sometimes, improper labelling of different grades also results in confused marketing and poor sale price.

- Though a good network of wholesale markets exists, less suitable transportation facilities and unplanned production, creates market glut, resulting in poor payment to the farmers. Lack of sufficient cold storage facilities to store surpluses for next day marketing also amount to a major constraint. Nonexistent or meagre local marketing system also results in low sale price as well as market glut.

- There has been inadequate attention towards post-harvest management to prevent losses and to ensure supply during odd periods. Infrastructure facilities like precooling units, cold stores, refrigerated transportation system, packinghouses, modernised market places are either absent or negligible. Market information system is also either non-existent or not available in big *mandis* resulting in irregular production, uncertain availability of the produce and unorganised market prices.

Resource Availability

- Indian Agricultural Research Institute (IARI), the premier institute of agricultural research, education, technology development and extension is situated in the state and can be looked at, for all sorts of technical guidance.

- A large cultivable area in plain and also a sizable spread of Yamuna riverbed is under cultivation. Another 10,850 ha of cultivable waste land, 11,708 ha of

uncultivated land and 12,886 ha of fallow land are available to be brought under vegetable cultivation.

- Unemployed but educated rural youth and also women are available to be trained in vegetable cultivation for gainful employment and increased production.

- A fresh vegetable export zone (VEZ) can be established comprising a group of villages involved in custom production conforming to norms of export in certain low volume high value vegetables.

- Protected cultivation of off-season vegetables with high quality, particularly during rainy season and winter can be promoted with the improved technologies.

- Organic farms can be established and recycled wastes from city and APMC *mandis* (fresh vegetable sale points) consumed as organic manure. This will also reduce environmental pollution and health hazards.

- A large number of processing and preservation units are functioning, though on part time basis, because of irregular supply of raw material. Ensuring their full time functioning in an organised way will assure utilisation of market glut as well as availability of products during off-season.

- An excellent network of marketing of agricultural produce under APMC already exists to satisfy wholesale marketing requirements. There are over nine regional *mandis* in different parts of Delhi.

- Delhi climate is suitable for cultivation of all types of seasonal as well as perennial vegetable crops. Off-season cultivation is also possible as has been demonstrated through polyhouse and polytunnel cultivation during rainy season and low temperature regimes.

- Facilities for training the farm supervisors as well as farmers exist both in the Department of Agriculture/Horticulture, Delhi, as well as at IARI, for making available trained manpower in production including seed.

- An array of vegetable varieties suitable for cultivation under both biotic and abiotic stresses, for production of high nutrition, higher biomass (quantity) and for specific end-use is available (courtesy IARI, ICAR) to suit different conditions of production and utilisation.

- Infrastructure exists for seed multiplication and distribution and also for production technology demonstrations in the form of several farms under Delhi government's Department of Agriculture/Horticulture.

- A network, to some extent, also exists under the Department of Agriculture/ Horticulture of Delhi government to help in dissemination of new technologies up to farm level and for monitoring of their progress/adoption.

- IARI has developed a number of production technologies (some are listed below), which are available for popularisation and adoption:

    i. Off-season nursery production to help enhancing availability of produce in cucurbitaceous vegetables.

    ii. Off-season production technology under protected cover for high value vegetables like cucumber, summer squash, tomato and capsicum.

    iii. Almost year-round production of radish, tomato, cauliflower using suitable varieties in successive sowings.

    iv. *Kharif* onion production to reduce storage requirement, fetch higher returns, also stabilise market price.

    v. Easing and economising hybrid seed production in pumpkin, bottle gourd, ash gourd, bitter gourd, luffa, etc., to help employment generation, reduced cost of F1 hybrid seed, increased F1 hybrid seed availability.

    vi. Ratooning in okra and brinjal to extend the crop avail134 ability beyond the normal season under open field. This ensures availability of the produce during lean/offperiods. vii. Off-season production technology of cucurbitaceous vegetables in riverbed and *diara* land.

- A good road network exists in the state for transporting cultivation inputs to the farm and for transport of produce from farms to the markets/consumers. Similarly, sufficient irrigation facilities in the form of canals and bore wells also exist. However, drip and sprinkler irrigation/fertigation facilities need generation.

- To help organic farming *goshalas* and dairy farms also exist in the state to provide organic manure (e.g., FYM, composts, etc.) and such other related inputs.

- Branches of different banks are available in every locality to possibly extend credit facilities to farmers through these branches.

Strategy

Delhi, having ever-increasing consumer population, requires extra procurement of horticultural produce, particularly vegetables from neighbouring states of Uttar Pradesh, Haryana and Rajasthan. The present day production of around seven lakh tonnes of vegetables is not sufficient and, as such, intensive vegetable cultivation on available land, on scientific lines, using latest technologies, should be adopted/promoted. Further, additional land, including *diara* land, has to be reclaimed and brought under vegetable cultivation. Efforts have to be made on reducing post-harvest losses and utilising/avoiding market gluts, improvement in produce management and utilisation strategy, including processing and systematic marketing. Improved marketing information system has also to be developed. Important vegetable crops which hold promise in cultivation are onion, *bhindi*, chilli, bitter gourd, tomato, potato, brinjal, cauliflower, peas, bottle gourd and cucumber. The thrusts have to be decided for programmes on long term and short-term

basis. In addition, some medicinal and aromatic plants also need promotion in cultivation for use in therapeutic and pharmaceutical industry.

A brainstorming session was held in New Delhi, to deliberate on these issues.* The following recommendations emerged as a result of deliberations at this Session.

Recommendations

- Horticulture advisory service and extension network of the NCR Delhi, needs to be strengthened. Awareness generation about IPM, IPNM, biological pest control and off-season vegetable production technologies should be given major thrust through preparation and distribution of informative material on vegetable cultivation on scientific lines.

- Modern micro-irrigation systems (drip, sprinkler) including fertigation, arrangement of supplies for installation of systems on cost basis needs to be promoted to improve cost-benefit ratio in vegetable production.

- Protected crop and nursery production technology should be popularised so as to make it profitable/viable on commercial scale. This will also help in off-season production of vegetables.

- Production of hybrid seed and use of pest-resistant high yielding F1 hybrids and varieties of vegetables in commercial cultivation need promotion. Hybrid seed-production techniques developed by IARI should be used to economise seed production cost.

- Export production farms, particularly for vegetables should be established.

- Infrastructural facilities for post-harvest management *viz*., cool transport chain, precooling units, packing houses, short- and long-term cold stores, etc., should be improved.

- Human Resource Development programmes, by giving more emphasis on training of farmers and farm supervisors in the field of scientific cultivation of vegetable crops, as well as multiplication of seed and planting material should be strengthened.

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* *A brainstorming session on Peri-urban Vegetable Cultivation in NCR Delhi, for improving urban health, generating rural employment and improving income of the farmers was held on 23rd December 2003, under the convenership of Dr. S. Nagarajan, at IARI in New Delhi. The participants comprised representatives from National Horticultural Board (NHB), Agricultural Produce Marketing Committee (APMC: Subzi Mandis), National Horticulture Research and Development Foundation (NHRDF), Agricultural and Processed Food Products Export Development Authority (APEDA), NABARD, Fruit & Vegetable Project of Mother Dairy, Delhi State Department of Agriculture, NSC, IFFCO, KRIBHCO, ICAR Headquarters and scientists from various divisions of the IARI.*

- Yamuna riverbed (main *diara* and upland *diara*) area for vegetable cultivation on scientific terms should be developed.

- There is need for generation of awareness and establishment of on-farm storage, processing and preservation units.

- System towards making available information regarding demand, supply, price, market outlook, consumers' preference, marketing channels and practices to help streamlining sale of the produce should be developed.

- Extension network to help dissemination of knowledge/ technologies (IARI vegetable production technologies) and monitoring their adoption; generation of written material on technology transfer and arrangement for its adoption should be strengthened.

- Commercial nursery production units should be established.

- Contract cultivation/cooperative farming should be encouraged.

- Model production farms with quality considerations for fresh vegetable export should be established.

- Micro-irrigation (drip, sprinkler), and fertigation systems need to be promoted.

- Reclamation and conversion of unutilised cultivable land, waste land, fallow land, and riverbed and *diara* land area into scientific vegetable cultivation.

- Development of market information system to regulate supply, price, and efficient sale of the produce, establishment of Farmers' Sale Points and promoting farmer based cooperative marketing.

- Establishment of organic vegetable farms for elite class and for selected vegetables.

Government of NCR Delhi, should establish viable linkages with the concerned government departments of the adjoining states of Haryana, Uttar Pradesh and Rajasthan for implementation of the policy issues in a mission-mode approach. IARI can be the hatching ground to form small projects on different component issues on the suggested lines. Financial institutions should provide credit in the form of short-term soft loans to the farmer. The technologies and improved vegetable seed could be made available by IARI. Expertise in the form of contract vegetable production and sale, can also be taken from Fruit and Vegetable Project of Mother Dairy. Expertise available in the IARI could be utilised for imparting training on various aspects of scientific vegetable cultivation in peri-urban areas. The ultimate aim should be to improve socioeconomic status of the vegetable growers of NCR Delhi, later to be adopted by other metros.