

**ROOFTOP VEGETABLE GARDEN- A NEW CONCEPT OF ORGANIC FARMING  
CONTEXT OF KITCHEN GARDEN AND CONTAINERS GARDEN SAVE  
CHEMICALS BASED CONTAMINANT FOOD, WATER AND SPACE**

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**ABSTRACT**

Rooftop kitchen garden formed on the building due to the various opportunities of urban people. Rooftop garden is best example of integrated farming developed in a urban agriculture. In 2020 onward the urban agriculture is act a important role in urban people. Rooftop kitchen garden provide vegetable, fruits, spices, from own roof. Professional people are adopted frequently and give importance to cultivate rooftop farming as kitchen garden. The container garden is defined as the planted or cultivation take place by container at rooftop. Rooftop garden require less water and soilless culture. It plans to cultivate in containers and reduce space of roofs. Irrigation facility is become easy to cultivate. Strom and rain water is also use directly in rooftop. The Bio-compost, bio-fertilizer, culture media used on rooftop garden. During COVID-19 pandemic rooftop garden take part very important role for protection and food security. Rooftop garden, balcony garden, terrace garden are important part of the urban agriculture which is provide organic fresh vegetable to kitchen.

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**INTRODUCTION**

The roof garden is a garden on the roof. This means that each roof covers with plants such as trees, shrubs, and bushes and grasses. Roof gardening can also be defined as 'environment or nature in the sky. Similarly if vegetables are allowed to grown the roof in place of other ornamental plants than it is called roof top vegetable garden. Green roofs are roofs of buildings covered with a growth substrate and plants, which are also known as roof gardens, living roofs, and eco-roofs. Urban communities face many challenges related to the health and well being of citizens. Many of these challenges arise as the direct consequence of dense urban environments. Industry, automobiles, and impermeable concrete and asphalt surfaces combine to negatively impact upon the air and water quality, while due to climate change there is a continuous increase in the atmospheric temperature because of global warming. Intense competition for land decreases green space, and there is a subsequent spiritual disconnect from agricultural roofs and the natural world. In urban locations, high night temperature caused by the heat island effect makes it difficult to live there Rooftop comfortably in the summer. Gardening is expected to reduce temperature and excessive heat energy absorption from solar radiation, thus resulting in a significant energy saving for air-conditioning in a building.



**Figure 1** Rooftop smart kitchen vegetable garden using vermiculite in Bhubaneswar.

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In addition growing vegetable on roof top reduces the expenditure on purchase of vegetable from the market. It also provides minerals rich good quality fresh organic vegetable free from chemical, thus contributing to nutritional security.

## STUDY AREA

Bhubaneswar [20.270N 85.840 E] is an ancient city in India's eastern state of Odisha, India. It is a smart city declared date on 28 January 2016 and also called as temple city and capital of state Odisha. Due to the India declared smart city the smart farming is growing on the rooftop farming is one of the interesting cultivation in Bhubaneswar city of India. Bhubaneswar is dense populated city of India. It contain large space of roof the people of Bhubaneswar are very much interested to cultivate rooftop, terrace and balcony farming.

## MATERIAL AND METHOD

The relevant information on the subject has been gathered through various primary and secondary sources. The secondary data are collected from internet, media, newspaper, journal, and organisations etc. The primary data are collected from rooftop gardeners. A questionnaire prepared by survey of household Owners and a survey of residents and respondent stakeholder and responsible authorities of selected public and commercial buildings investigated the viability of rooftop gardening (RTG).



Figure 2 Prativa Khilar and Prakash Chandra Behera involvement in rooftop garden during covid-19 pandemic

In addition, there was also a focus group discussion where participants were invited to discuss the city's rooftop gardening opportunities and issues. For example, NGO people (on

providing microcredit), City Corporation Departments Bhubaneswar development authority (BDA), land and house owners and the general public were asked to express their opinion.

## Types of Roof Garden

There are three primary types of rooftop garden for vegetables production-

**Producing Green Roofs:** On which crops are directly grown into (shallow) beds in a soil-based growing medium that impossibly placed on top of a water proof membrane or additional layers such as a roof barrier, drainage layer and an irrigation system.



Figure 3 Rooftop kitchen garden diversity of vegetables in Bhubaneswar

## Container Gardens

Growing of vegetables, herbs, flowers in pots, buckets, containers, poly bag and bottles or raised beds which contain a soil-based growing medium. This medium can be made up of mixtures of soil, Compost or woodchips. Rooftop containers can range from simple pots to more elaborate systems. As much as possible locally available and recycled material could be used. Different companies are manufacture varieties of containers for rooftop garden.

**Table 1** Selection list of vegetable cultivation in rooftop garden

S.L.NO	Vegetables	Local name	Botanical name	Family	Plant part used
1	Amaranth	Prickly amaranth	<i>Amaranth viridis</i>	Amaranthaceae	Green leaf
2	Apple gourd	Tinda	<i>Praecitrullus fistulosus</i>	Cucurbitaceae	fruit
3	Arrowroot	Arrowroot plant	<i>Maranta arundinacea</i>	Marantaceae	fruit
4	Arugula	Rocket	<i>Eruca sativa</i>	Brassicaceae	fruit
5	Ash gourd	petha	<i>Benincasa hispida</i>	Cucurbitaceae	fruit
6	Asparagus	Sparrow grass	<i>Asparagus officinalis</i>	Liliaceae	Green leaf
7	Bamboose shoot	<i>Bambusa vulgaris</i>	<i>Bambusa balcooa</i>	Poaceae	stem
8	Banana	Kela	<i>Meusa acuminata</i>	Musaceae	fruit
9	Basil	Babui tulsi	<i>Ocimum basilicum</i>	Lamiaceae	fruit
10	Beet root	Beta vulgaris	<i>Beta vulgaris</i>	Chinopodiaceae	root
11	Bengal gram	chana	<i>Cicer arietinum</i>	Fabaceae	fruit
12	Biter gourd	Karela	<i>Momordica charantia</i>	Cucurbitaceae	fruit
13	Bellpepper	Simla mirchi	<i>Capsicum mannuu</i>	Solanaceae	fruit
14	Black eyed bean	Vniga unguiculata	<i>Vigna unguiculata</i>	Legumenoceae	fruit
15	Black piper	Kala mirchi	<i>Piper nigrum</i>	piperaceae	fruit
16	Bottle gourd	Calabash Lau	<i>Lagenaria siceraria</i>	Cucurbitaceae	fruit
17	Bread fruit	Artocarpus	<i>Artocarpus altilis</i>	Moraceae	fruit
18	Brinjal	Began	<i>Solanum melongena</i>	Solanaceae	fruit
19	Broad beans	Fabaceae	<i>Vicia fba</i>	Fabaceae	fruit
20	Broccoli	Barccoli	<i>Brassica oleracea,italica</i>	Brassicaceae	fruit
21	Butter gourd	Caribbean	<i>Momordica charantia</i>	Cucurbitaceae	fruit
22	Cabbage	Bandh goobi	<i>Brassica oleracea capitata</i>	Crucifere	leaf
23	Capsicum	Simlamirch	<i>Capsicum annuum</i>	Solanaceae	fruit
24	Carrot	Gajar	<i>Daucus carota,Sativus</i>	Ambeliferae	root
25	Cassava	Cassava	<i>Manihot esculenta</i>	Euphorbiaceae	fruit
26	Cauliflower	Phool Gobhi	<i>Brassica oleracea botrytis</i>	Crucifere	flower
27	Celery	Apiales	<i>Apium graveolens</i>	Umbeliferae	fruit
28	Ceylon spinach	Basella lab	<i>Malabar spinach</i>	Basellaceae	leaf
29	chilli	Mirch	<i>Capsicum frutescens</i>	Solanaceae	fruit
30	Chrysanthemum	mumington	<i>Chrysanthemum</i>	Aseteraceae	leaf
31	Citrus	Citrus reticulata	<i>Citrus limon</i>	Rutaceae	fruit
32	Cluster been	Gwaar fali	<i>Cyamopsis tetragonoloba</i>	Leguminoceae	fruit
33	Colocasia	Colocasia	<i>Colocasia esculent</i>	Araceae	stem
34	Coriander	Hara Dhaniya	<i>Coriandrum sativum</i>	Apiaceae	Leaf and seeds
35	Corn	Makka	<i>Zea mays</i>	Poaceae	Corn
36	Cow pea	Blackeye peas	<i>Vigna sinensis</i>	Leguminoceae	fruit
37	Cucumber	Kheera	<i>Kukumis sativus</i>	Cucurbitaceae	fruit
38	Cucumis	Cucumber	<i>Cucumis statives</i>	Cucurbitaceae	fruit
39	Curry leaf	Kadhi patta	<i>Murraya koenigii</i>	Rutaceae	leaf
40	Dill	Sabbasige soppu	<i>Anrthum gravelones</i>	Apiaceae	fruit
41	Drumstick	Olifera	<i>Moringa oleifera</i>	Moringaceae	Fruit ,leaf
42	Egg plant	Aubergine	<i>Solanum melongena</i>	Solanaceae	fruit
43	Elephant foot yam	A.paeoniifolius	<i>Amorphophallus</i>	Araceae	fruit
44	Fava beans	Sem phalee	<i>Vicia faba</i>	Fabaceae	fruit
45	Fennel	Sweet fennrl	<i>Foeniculum vulgare</i>	Apiaceae	fruit
46	Fenugreek leaf	Hari methi	<i>Trigonela foenum</i>	Leguminoceae	fruit
47	French beans	Rasma	<i>Phaseolus vulgaris</i>	Leguminoceae	fruit
48	Garlic	Lahasun	<i>Allium sativum</i>	Amryillidiaceae	stem
49	Ginzer	Adarak	<i>Zingiber officinale</i>	Zingibertales	stem
50	Grape	Grape	<i>Vitaceae</i>	Vitaceae	fruit
51	Green beans	Haree sem	<i>Phaseolus vulgaris</i>	Fabaceae	fruit
52	Green long been	Yardlong bean	<i>Sesquipedails</i>	Leguminoceae	fruit
53	Green mustard	Black muster seed	<i>Barassica juncea</i>	Brassicaceae	fruit
54	Green onion	Onion	<i>Spring onion</i>	Amaryllidaceae	fruit
55	Green pepper	Capsicum	<i>Capsicum annuum</i>	Solanaceae	fruit
56	Ground nut	Archis hypogaea	<i>Arachis hypogaea</i>	Fabaceae	fruit
57	Guava	Psidium guajava	<i>Psidium guajava</i>	Myrtle family	fruit
58	Indian been	Sem	<i>Lablab purpureus</i>	Leguminoceae	fruit
59	Indian gooseberry	Gooseberry	<i>Phyllanthus emblica</i>	Phyllanthaceae	fruit
60	Kale	Kala	<i>Brassica oleraceavar.sabellica</i>	Brassicaceae	fruit
61	Kang kong	Water spinach	<i>Lpomoea aquatica</i>	Convolvulaceae	fruit
62	Kidney bean	Phaseolus vulgaris	<i>Phaseolus vulgaris</i>	Fabaceae	fruit
63	Knolkhol	Knol Khol	<i>Brassica oleracea</i>	Brassicaceae	fruit
64	Kohlrabi	Kohlrabi	<i>Brassica oleracea gongylodes</i>	Germanturnip	fruit
65	Lady finger	Bhindee	<i>Abelmoschus esculentus</i>	Malvaceae	fruit
66	Legume	Leugume	<i>Fabaceae</i>	Leugumenoceae	fruit
67	Leek	Allium Porrum	<i>Allium ampeloprasum</i>	Amaryllidaceae	fruit
68	Lemon	Lembu	<i>Citrus, limon</i>	Rutaceae	fruit
69	Lichi	Lichu	<i>Litachi chinensis</i>	Sapindaceae	fruit
70	Lime	Citrus ,latifolia	<i>Citrus, aurantifolia</i>	Rutaceae	fruit



71	Lotus cucumber	Loroottus	<i>Nelumbo nucifera</i>	Nulunbonaceae	fruit
72	Maiz	Makka	<i>Zea mays</i>	Poaceae	fruit
73	Mango	Amba	<i>Mangifera indica</i>	Anacardiaceae	fruit
74	Mentha	Mentha	<i>Mentha piperita</i>	Lamiaceae	Green leaf
75	Mint	Lamiaceae	<i>Mentha</i>	Lamiaceae	fruit
76	Mouse melon	Mouse melon	<i>Melothria scabra</i>	Cucubitaceae	fruit
77	Musk melon	Muskmelon	<i>Cucumis melo</i>	Cucurbitaceae	fruit
78	Mustard green	Brassica juncea	<i>Brassica juncea</i>	Brassicaceae	fruit
79	Okra	Bhindi	<i>Abelmoscus esculentus</i>	Malvaceae	fruit
80	Onion	Pyaz	<i>Allium cepa</i>	Amryillidiaceae	leaf
81	Orange	Orange	<i>Citrus sinensis</i>	Rutacdae	fruit
82	Oregano	Origanum vulgare	<i>Origanum vulgare</i>	Lamiaceae	fruit
83	Pea	Matar	<i>Pisum sativum</i>	Leguminoceae	fruit
84	pepermint	Pudeena	<i>Mentha piperita</i>	Lamiaceae	fruit
85	Pineapple	Pineapple	<i>Ananas comosus</i>	Bromeliaceae	fruit
86	Pointed gourd	putal	<i>Trichosanthes dioica</i>	Cucurbitaceae	fruit
87	potato	Aloo	<i>Solanum tuberosum</i>	Solanaceae	fruit
88	Pumkin	Cucurbita moscchata	<i>Cucurbita</i>	Cucurbitaceae	fruit
89	Purslane	Kulapha	<i>Portulaca oleracea</i>	Portulacaceae	fruit
90	Quince	Cydonia oblonga	<i>Cydonia oblonga</i>	Rosaceae	fruit
91	Radish	Moolee	<i>Raphanus sati vus</i>	Cruciferae	root
92	Ridged gourd	Luffa	<i>Luffa aegyptiaca</i>	Cucurbitaceae	fruit
93	Romain leave	Romaine lettuce	<i>Lactuca sativa</i>	Asteraceae	Leaves
94	Round gourd	Round ground	<i>Praecitrullus fistulosus</i>	Cucurbitaceae	fruit
95	Runner been	Runner been	<i>Phaseolus coccineus</i>	Fabaceae	fruit
96	Snake gourd	Chichinda	<i>Tricosanthes cucumeri</i>	Cucurbitaceae	fruit
97	Sorrel	Sorell	<i>Rumex acetosa</i>	Polygonaceae	fruit
98	Spinach	Palak	<i>Spinacia oleracea</i>	Chinopodiaceae	Green leaf
99	Spine gourd	Spin ground	<i>Momordica dioica</i>	Cucurbitaceae	fruit
100	Strubery	Strawberry	<i>Fragaria ananassa</i>	Rosaceae	fruit
101	Sugar beet	Beet	<i>Beta vulgaris subsp</i>	Amaranthaceae	root
102	Sugarcane	Sugar cane	<i>Saccharum officinarum</i>	Poaceae	stem
103	Swede	Swede	<i>Brassica napobrssica</i>	Brassicaceae	fruit
104	Sweet potato	Shakar kand	<i>Ipomoea batatas</i>	Convulvolaceae	root
105	Taro root	Taro tree	<i>Colocasia esculent</i>	Araceae	root
106	Tendli	Tendill	<i>Coccinia grandis</i>	Cucurbitace	fruit
107	Tomato	Tamaatar	<i>Solanum lycopersicum esculentum</i>	Solanaceae	fruit
108	Turmeric	Haldee	<i>Curcuma longa</i>	Zingiberaceae	stem
109	Turnip	Shalagam	<i>Brassicab rapa</i>	Brassicaceae	root
110	Utilissimus	Cucumids	<i>Cucumis</i>	Cucurbitaceae	fruit
111	Water melon	Watermelon	<i>Citrullus lantatus</i>	Cucurbitaceae	fruit
112	White Goose Foot	Bathua	<i>Chinopodium album</i>	Amaranthaceae	Leaf
113	Wild spinach	Spinacia oleracea	<i>Chenopodium album</i>	Amaranthaceae	Leaf
114	Yam	Patato yam	<i>Dioscorea lata</i>	Dioscoreaceae	fruit
115	Zucchini	cucurbit	<i>Zucchini courgette</i>	Cucurbitaceae	fruit



Figure 4 Container used on rooftop gardens in Bhubaneswar

### Balcony Garden

Plain according to the space available in the balconies will be normally very less compared to other gardening style maximum utilization of the available space of must be done two away this using trade plants stand than display may plants of small are of the hangs pots of boxier or rivalling .user boxes that can be stacked consider use for growing edible. Here and vegetable great three mixed a annual or to display will to as partial one .if more than 30sq is available all parts /poly bags can be kept on the vertical arrangement will be more effectiveness in advise kept them grow bags, it is advices to keep the floor case of maintained and clines growth bags /poly bags should be kept b on arise plate from material farm single step of 2-3 step can be poly bags stragglers shape led or curve material farms can be used according to the space available. Multi-tiered way of arrangement is useful for displaying the beautiful of the flats as well to utilize the available spaces of light balcony rankings, of half wall less can be utilized for hanging pots and through containing and small ornamental plant. Hanging baskets pots can be hanging from cleaning now a day's wide verticals of gardening material valuable in the market which is allows you to utilize every single corner or spaces in the balcony. Earthen pots, terracotta pots, fibres glass materials, plastics pots of various shapes and quality grow bags polythene bags are the different inches to select from. Selection should be done based open the budget purpose and aesthetics value. For growing flowering plants and ornamentals pots of various size and shape can be selected according to the structure of the plants .for growing common vegetable like chilly ,tomato, brinjal, vegetable ,cropage pots of grow bags be as standard size so there spaces of proper growth and developments of roots.



Figure 5 Kichen garden on Terrace in Bhubaneswar

### Hydroponic systems

Which involve growing plants using water based nutrient solutions in place of soil. They require liquid fertiliser inputs. There are exposed hydroponic systems used in open-air settings, as well as hydroponic systems Brown under cover (glass or plastic) to help increase yields and extend the growing seasons.



Figure 6 Hydroponics rooftop garden in Bhubaneswar

### Benefits of Roof Top Garden

1. Reducing green house gases emissions and energy use by reducing the Urban Heat.
2. Reducing rainwater run-off and use dew water
3. Improving biodiversity and conservation
4. Reducing air pollution
5. Reducing food insecurity and organic based food
6. Improved living environment create habitat for birds, butterflies and bees and aquarium
7. Provide outdoor space for you to enjoy and environmental sustainability and beautify the building and ecosystem service

### Constraints of Rooftop Garden

Rooftop garden have constraint to negative influence for practitioner. Heavy load to the building thought to the effect of perception of Gardner. It has use soil less or media culture may be percept. Legal issue also stand for rooftop garden. Buildings structure buildings structure further defines precise weight bearing capacity of a roof and also helps gardeners on planter to decide size locations. We consider only urban contemporary structure for the discussion here for example, building with loaded bereaving wall structure can take lesser weight as compared to buildings but with beams and columbic. beam and coulomb structure also gives more choices for planter material size and there locations Life of a structure also material while considering rooftops from perspectives of weight bearing capacity and water seepage. A structural engineer and architect should be consulted before creating a rooftops garden if you are lining to have a landscaped rooftops garden. Water proofing roof is high monsoon areas are greenery and could using multiple technique water proofing generally envelopes layer risen and cement these material very with change of the technology and time to avoid water seepage. However in area where monsoon is moderate or scanty water proofing is not given due to importance to create a rooftops garden and basic minimum water proofing is mandatory. In some cases availability responses will not compensate for the effects of harsher climates and water scarcity. Environmental factors like yours geographically location, local climate of your city, on direction on your roof tops, wind directions water flow on the roof tops slope and shadows of nearby buildings play importance role in selection of plants types and there healthy growth. Bhubaneswar is one of the cyclonic areas remarkably damaged of rooftop garden plants.







Figure 7 Severe damage of rooftop garden during cyclone fani in Bhubaneswar 2019

### Technical Aspects of Rooftop Garden

As weight is a concern, rooftop growing is often taking place in shallow beds or containers. If the roof is quite limited in the weight it can bear, then some light weight material should be mixed with the soil, or the beds made very shallow. If sufficient compost is not available, plants can be successfully grown in fresh organic matter of many kinds (such as coco peat woodchips, Growing media). Such beds are fertilized and covered with at least thin covering of compost or soil. Almost any vegetable can be grown in shallow beds. Once the beds or containers are established, they are like regular gardens except in their need for more frequent watering.

### Soilless Culture

Soilless culture bags, pots, or through with a light weight medium is the simplest, most economical and easiest to manage of all soilless systems. There are different types of containers is available i.e. long wooden through in which one or two rows of plant are grown. Polyethylene bags or rigid plastic pots containing one to their plant .in the bag or pot system. The solution is not recalculated .the most common type of media used in containerized system of soilless culture is peat-lite, of a mixture of break and woodchips .bag or pot systems using bark chips or peat-lite are in common use. Nutrient solution is supplied for a fertilizer proportioned or media. Any excess is drained out from the system through drain holes in the base of the containers. Thus, the concentration and balance of nut rants in solution feed to the plants in the periodically to determine the king of necessary adjustment, and avoid the possibility of solution excess or deficiencies.

### Growing Medium

Great emphasis should be placed on developing lightweight systems for rooftop applications. If there were no weight considerations, a rooftop bed or container of 9-12 inches depth would be about ideal. The choice for composition of the growing medium depends on weight considerations and on the space and nutrients that different plants need for their growth. It is thus more efficient to choose a lighter medium in order to have a deeper soil depth and as a result a more efficient plant growth and health. Several, growing materials like vermiculite,

sand, wood chips, grass clippings that have spent several weeks in a pile, household compost, corncobs, rice hulls, shredded coconut tusks, sugar cane biogases (what is left after the juice is quizzed from the came ) coffee pulp and polite can be used to make up the medium. The growing medium should contain sufficient organic matter and allows the roots to aerate sufficiently.

### Irrigation Technics

Watering the plants in the balcony needed to be done carefully, watering the balcony garden may become if you have a lot post on have to carry a large quantity of water in containers. Adopts smart operation for watering like fixing a close water source and connecting a small household house. Another operation in connecting a drips irrigation system to the available. The verity of do-it yourself read madly set of drips line self-watering spikes which can be attached to bottle can b used .the setup can unused water supply to the plants for a few days when you out station .one problems which at the point where the water drops flass and the other side of the pots of not being utilize fully, this problems must be address by occasionally adjusting the points where water drops water drops falls. This irrigation delivery method number of applications, and total irrigation amount varies depending on the specific crop requirements, spray and gripping system.

### Organic Fertilizer

Organic method of farming can be adopted as per people individual interest, for chemical fertilization soluble chemical fertilizer formula caution can be use. Care should be including primary nutrients N, P and K as well as secondary and micronutrients formations. For organic nutrients management nutrients organic source like vermin wash, cow dung supply bio-fertilizer formations, house hold composed wash can be used a lot of organic nutrient source in the available in the market whose authenticity it is not walls established but most of them are formed to provide good result in respect to growth and yield of plants. Umpteen number of organic labelled produce bio-fertilizer sewage extract humid acids ammonic acids etc. From various companies are available for organic grower. Vermicompost available in market. Household waste items like kitchen waste can be effectively used as a source of nutrients for the plants those who can spend more for more there gardens can make their own organic manures using the available materials. A compost bin can be used to convert the kitchen waste to compost a part from the compost the liquid which oozes out of the compost bio-fertilizer seaweed extract humid acid fish amino acid act from various companies are available for organic growers. Household waste like kitchen waste can be effectively used as source of nutrients for the plants, those who can spend more time for their gardens can make their own organic, and using the available materials. A compost been be used to convert the kitchen waste to composed a compost from the liquid which oozes out of the composed cell can be diluted applied soil or given flavour, vegetable fish waste can be performed using bio compost in clean container and can be helped applied to the plants powdered egg shells are good source of the calcium for the plants.



Figure 8 Mrs. Keeny Mohapatra takes part solid kitchen waste management to produce bio-fertilizer.

## RESULT AND DISCUSSION

Crops should be durable, and capable of resisting wind and other hard climatic conditions are ideal for rooftop gardening. Thin, crisp stems plants should be avoided. Root vegetables, like carrots, radish and turnips are well-suited due to relatively low growth. A thick root also helps to anchor the plants into the ground, providing resistance to wind. Low growing greens, including lettuce and spinach, are also well-suited to rooftop growing, as are some varieties of climbing beans which can withstand for best results, vegetables grown on rooftops should be started in flats or similar containers under screens or netting that will prevent soil from drying out. Amend growing medium with plenty of water high-quality organic constituents,

such as compost; and spread a thin layer of mulch around plants upon transplanting. These measures will help to retain moisture. Ideally start should be transplanted in days are constraint on cloudy or slightly overcast days to prevent sun and heat shock.

### Future Perspective

Now days RTG grow very rapidly because of bad influence of covid-19 protocol. Roof top farming is implemented each and every city and towns of India. Bhubaneswar is one of the smart city now growing of rooftop farming successfully. There have a safe guard of opportunity obtain from rooftop garden. Pure, chemical free fresh vegetable and fruits are easily cultivated from rooftop.

## CONCLUSION

As population of Indian cities are growing higher and higher, demand for food and expenditure on food are also increasing but the resource is scarce as agricultural land is converting to residential, commercial or industrial land uses. Thus it reduces the possibility to grow more and different agricultural food products. Again food contamination such as harmful chemical and inorganic fertilizer and pesticide usage to increase production etc. is increasing at an alarming rate. In this circumstance, to solve these problems and find a way out, initiation of growing vegetable on roof top can be a possible and potential solution. Rooftop vegetable farming can help to meet food demand by supplying fresh and hygienic vegetables, reducing household expenditure for buying vegetable, and creating healthy atmosphere by improving air quality and absorbing carbon from air and lessening the impact of climate change. Now days rooftop garden grow very rapidly because of bad influence of covid-19 protocol. Roof top farming is implemented each and every city and towns of India. Bhubaneswar is one of the smart city now growing of rooftop farming successfully. There have a safe guard of opportunity obtain from rooftop garden. Pure, chemical free fresh vegetable and fruits are easily cultivated from rooftop garden.

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