

The development of fruits and vegetables in relation to the Nutrient situation in Vietnam

Ass.Prof. Vu Manh Hai

Director of the Research Institute of Fruits and Vegetable
Vietnam Agricultural Academy Institute

Dr. Le Van Bam

Deputy Director of Dept. of Science and Technology
Ministry of Agriculture and Rural Development

MSc. Bui Quang Dang

Vice head of Fruit department, the Research Institute of Fruits
and Vegetable
Vietnam Agricultural Academy Institute

INTRODUCTION

Fruit and vegetable production in Vietnam has developed a great deal in recent years. This sector has experienced rapid growth because income per hectare from growing fruits is 4-8 times greater than from rice, and markets are expanding. As it has been easy to sell the products, producers have concentrated on quantity rather than quality. However, this system of production is likely to change, sooner or later, because traditional growing techniques that already applied are often irregular and inadequate, disease-control measures are poor, and markets are changing.

Following data is presented the rapid development of the fruit and vegetable crops in recent years when the problem of food lackage has been accordingly solved.

I. Fruit development in Vietnam.

Table 1: Fruit area cultivated in regions in Vietnam

No	Regions	1999		2004		Increased (%/year)	Compared to Gov. Plan	
		Ha	%	Ha	%		2010	%
	Whole country	496	100	746,8	100	8,5	750	99,6
1	Red River Delta	51,9	10,5	78,4	10,5	8,6	60	130,7
2	North Mountains	109,9	22.2	171,1	22m9	9,3	170	100,6
3	North Central Coast	42,3	8,5	56,2	7,5	5,8	70	80,3
4	South central Coast	20,8	4,2	28,9	3,9	6,8	60	48,2
5	Central Highland	12,9	2,6	22,6	3,0	11,9	50	45,2
6	South-East	66,9	13,5	127,5	17,1	13,8	90	141,7
7	Mekong River Delta	191,3	38,6	262,1	35,5	6,5	250	104,8

Total production of fruit in whole country is estimated of about 5.1 tons and per capita consumption is more than 60 kg, says, nearly 2 times higher than that in 1990. It can be said that the development of fruit crops takes very important part in

decreasing the quantity of cereal food consumed and improving remarkably the daily nutrition of the people.

According to the unpublished data from GDS, the average quantity of food consumed in terms of rice and the others, via maize, cassava, sweet potato ECT...in recent year has been decreased sharply (estimated of about 60-70% in comparison with that in the eighty decades). It has also contributed partly in increasing the health status of the human, particularly the younger generation. With the new policy of the Government, farmers in various regions in whole country have planted fruit crops not only in their home orchards but also in the land where paddy rice were cultivated before, provided that the income should be higher.

Table 2. List of Fruits of Vietnam

A. Major Fruits

Scientific name	Common name	Vietnamese / other SE Asian names
<i>Anacardium occidentale</i>	cashew	Dao Lon Hot, Cay Dieu / Jambu Monyet (Ins), Gajus, Jambu Monyet (Mal), Kasoy (Phi), Mamuang Himmaphan (Tha)
<i>Ananas comosus</i>	pineapple	Dua', Dua Thom / Nanas, Danas, Nanah (Ins), Nanas, Nanas Pager (Mal), Nanas, Apangdan (Phi), Sapparot (Tha)
<i>Annona squamosa</i>	sugarapple	Na, Mang Cau Ta / Sirkaja, Sarikaja, Atis (Ins), ona sweetsop Sri Kaya, Buah Nona, Sri Kaya (Mal), Atis ((Phi), Noi Na (Tha)
<i>Annona muricata</i>	soursop	Mang Cau Xiem/Sirsak, Nangka Belanda, Nangka Seberang (Ins), Durian Belanda, Durian Benggaka, Durian Makkah (Mal), Guayabano, Atti, Illabanos (Phi), Thurian Thet, Thurian Khaek (Tha)
<i>Artocarpus altilis</i>	bread fruit	Sake [seedless] / Sukun [seedless], Kelur, Timbul [seeded] (Ins); Kelor [seeded] (Mal); Rimas [seedless], Kamansi [seeded] (Phi); Sa-ke [seedless], Khanum Sampalo [seeded] (Tha)
<i>Artocarpus heterophyllus</i>	jackfruit	Mit / Nangka (Ins, Mal), Jak, Lanka (Phi), Khanun (Tha)
<i>Carica papaya</i>	papaya	Du Du / Pepaya, Gedang, Kates (Ins), Betek, Ketelah, Kepaya (Mal), Kapaya, Lapaya (Phi), Malako (Tha)
<i>Citrullus lanatus</i>	water melon	Dua Hau / Betek (Ins), Beteka (Mal), Taeng Mo (Tha)
<i>Citrus aurantifolia</i>	lime	Chanh Vo Mong, Chanh Ta / Jeruk Napes, J. Pecel (Ins), Limau Napes, L. Asam (Mal), Dayap (Phi), Manao (Tha)
<i>Citrus maxima</i>	pummelo	Buoi / Jeruk Bali, J. Besar (Ins), Limau Betawi, L. Bali, L. Besar (Mal), Lukban, Suha (Phi),

		Som O (Tha)
<i>Citrus medica</i>	citron	Thanh Yen / Jeruj Sukade, Sitrun (Ins), Limau Susu (Mal), Bulid (Phi), Manao Khwai (Thai)
<i>Citrus reticulata</i>	mandarin	Quyt / Jeruk Keprok, J. Maseh, (Ins), Limau Kupas, L. Langkat, L. Cembul, L. Tommbong, L. Hijau (Mal), Sintones, Dalangghita (Phi), Som Khieo Wan, Som .Saeng Thong (Tha)
<i>C. reticulata x</i>	King	Cam Sanh / Jeruk Jepun, J. Cina, J. Cina
<i>C. sinensis</i>	mandarin	Licin, J. Kondeh, J. Cempage, J. Kuwik (Ins), Lim Tangor Cina, L. Kupa Raja
<i>C. reticulata x C. maxima</i>		Cam Bo Ha
<i>Citrus sinensis</i> orange		Cam/ Jeruk Manis, Chula, Choreng, (Ins), Limau Manis sweet orange L. Langgat, L. Hupa, L. Wangkang (Mal), Kahel, Daladan (Phi), Som Tra, Som Kliang (Tha)
<i>Cocos nucifera</i>	coconut	Dua/ Kelapa, Nyiur (Ins, Mal), Niog, Lobi, Inniug, Ongot, Giragira, I-ing, Ngot-ngot (Phi), Maphrao (Tha)
<i>Dimocarpus longan</i>	longan	Nhan / Lengkeng (Ins, Mal), Lamyai (Tha)
<i>Diospyros kaki</i>	persimmon	Hong / Kesemek, Buah Kaki (Ins), Buah Kaki Buah Samak (Mal), Phlap Chin (Tha)
<i>Durio zebethinus</i>	durian	Sau Rieng / Durian (Ins, Mal, Phi), Thurian (Tha)
<i>Fragaria x ananassa</i>	strawberry	Dau Tay / Arben (Ins), Strawberry (Mal), Freasa (Phi), Satroboery (Tha)
<i>Garcinia mangostana</i>	mangosteen	Mang Cut / Manggis (Ins, Mal, Phi), Mangkhut (Tha)
<i>Hylocereus undatus</i>	dragon fruit	Thanh Long / Kao Mangkon (Tha) (being a newly developed fruit, no local name in other country is available except for Thailand)
<i>Lansium domesticum</i>	langsap	Bon Bon / Langsat, Kokosan (Ins), Langsat, Langseh (Aglaia domestica) (Mal), Lansonos, Boboa, Buahan (Phi), Langsat (Tha)
<i>Litchi chinensis</i>	lychee	Vai / Litsi, Kalengkeng (Ins), Laici (Mal), Letsias, litchee Licheas (Phi), Linchi (Tha)
<i>Mangifera indica</i>	mango	Xoai / Mangga (Ins, Mal, Phi), Mamuang (Tha)
<i>Manilkara zapota</i>	sapodilla	Hong Xiem (N), Xaboche (S) / Sawo Manila, Ciku,

		chiku Sawo Londo (Ins), Ciku, Sau Menila, Zapote (Mal), Chico (Phi), Lamut, Lamut Farang (Tha)
<i>Musa</i>	banana	Chuoï / Pisang (Ins, Mal), Saging (Phi), Kluai (Tha)
AA		lady's finger Chuoï Ngu [King banana] (N), Chuoï Gia (S) / Pisang Mas (Ins, Mal), Kluai Khai (Tha)
AAA	Cavendish	Chuoï Gia / Pisang Ambol (Ins, Mal), Kluai Hom (Tha), Gros Michel.
BB	wild balbi	Chuoï Hot (pig banana) / Butuhan (Phi), Kluai Tani siana banana (Tha)
AAB	plantain	Chuoï Bom / Pisang Tanduk (Ins, Mal), Kluai Klai (Tha)
ABB	bluggoe	Chuoï Tay / Pisang Awak, P. Rastali (Ins, Mal), Kluai Namwa (Tha)
<i>Nephelium lappaceum</i>	rambutan	Chom Chom / Rambutan (Ins, Mal, Phi), Ngo (Tha)
<i>Passiflora edulis</i>	passionfruit	Lac Tien / Buah Negeri, Pasi, Konyal (Ins), purple, Buah Susu, B. Selasih, Markisa (Mal), Pasionaria, granadilla Maraflora (Phi), Lin Mangkon, Katoklok Farang, Saowarot (Tha).
<i>Persea americana</i>	avocado	Bo / Adpukat, Avokat (Ins), Buah Mentega, Avokado, Apukado (Mal), Luk Noei, Awokhado (Tha).
<i>Prunus selicina</i>	Plum	Man / Ijas Jepang (Ins, Mal), Phlam (Tha)
<i>Psidium guajava</i>	guava	Oi / Jambu Batu, Jambu Biji (Ins, Mal), Bayabas, Guayabas, Kalimbahin, Biabas (Phi), Farang (Tha)
<i>Punica granatum</i>	pomegranate	Lu'u, Thap Lu'u / Delima (Ins. Mal), Granada, Dalima (Phi), Thapthim (Tha)
<i>Pyrus pyrifolia</i>	oriental pear	Le /Apel Jepang (Ins), Lai (Mal), Peras (Phi), Sali (Tha)
<i>Sandoricum</i>	santol	Sau / Kecapi, Ketuat, Sentul (Ins), Sentul, Kechapi koetjape (Mal), Santol, Santor, Katul (Phi), Krathon (Tha)
<i>Spondias cytherea</i>	ambarella	Coc (S), Sau Van Nam (N) / Kedongdong Manis (Ins), (S. <i>dulcis</i>) otaheite apple Kedongdong (Mal), Hevi (Phi), Makok Farang, Makok Thet (Tha)
<i>Syzygium jambos</i>	roseapple	Ly, Bo Dao, Roi / Jambu Mawar, Jambu Kraton (Ins) Jambu Kelampok, Jambu Mawar (Mal), Tampoi, Bunlaun, Yambo (Phi)

<i>Syzygium</i>	Java apple	Man / Jambu Semarang, J. Klampok, J. Air Rhio (Ins)
<i>Samarangense</i>	wax apple	Jambu Air Mawar, J. Air Rhio (Mal), Makopa (Phi), Chomphu, C. Khieo, C. Nak, C. Kaem Maem (Tha)
<i>Tamarindus</i>	tamarind	Trai Me / Asam, Asam Jawa, Tambaring (Ins), Asam Jawa (Mal), Sambak, Sambalagi, Sampalok, Kalamagi, Salomagi, Salunagi (Phi), Makham (Tha)
<i>Vitis vinifera</i>	Grape	Nho / Anggur (Ins, Mal), Ubas, Papas, Parras (Phi), A-ngun (Tha)
<i>Ziziphus</i>	Jujube	Tau / Widara, Dara, Bidara (Ins), Bidara, Jujub, Epal <i>mauritanica</i> Indian jujube Siam, Kuku Lang (Mal), Manzanitas (Phi), Phutsa (Tha)

Minor Fruits of Vietnam

Scientific name	Common name	Vietnamese / other names
<i>Averrhoa bilimbi</i>	bilimbi	Khe Tau / Belimbing Asam, B.Wuluh, B. Butuk (Ins, cucumber tree Mal), Kamias, Iba (Phi), Taling Pring (Tha)
<i>Averrhoa carambola</i>	star fruit	Khe / Belimbing Manis, B. Segi (Ins, Mal), Balimbin carambola (Phi), Mafeung (Tha)
<i>Baccaurea</i>	Burmese	Giau Gia Dat, Giau Tien, Dzau Mien Dzuoi / Mafai <i>ramiflora</i> grape Setambun, Tajam Molek (Ins), Pupor, Tampoi, Tempui (Mal), Mafai Farang (Tha)
<i>Chrysophyllum cainito</i>	caimito	Vu Sua / Sawo Ijo, Sawo Hijo, SawoKadu star apple (Ins), Saawu Duren, Pepulut (Mal), Caimito (Phi), Sata Appoen (Tha)
<i>Citrofortunella</i>	calamondin	Quat / Jeruk Peres, J. Kasturi, J. Potong, Limon Cina, <i>microcarpa</i> China orange, Limon Cui (Ins), Limau Kesturi, L. Chuit, L. Sambal (Mal),
<i>Citrus microcarpa</i>	golden lime	Kalamondin, Kalamansi, Limonsito, Aldonisis (Phi),
<i>C. madurensis</i>	musk lime	Som Chit, Som Mapit (Tha)
<i>Citrus hystrix</i>	porcupine	Jeruk Purut, J. Lemon Swanggi, Lemon Purut, orange Lemo Titigila, Limo Kambang, Lemo Karbau, Lemo Kabi (Ins), Limau Purut (Mal), Kabog, Amongpong, Katan, Kamugau, Buyak, Daruga, Malatbas, Kabuyan, Piris, Muntai, Pinukpok, Kobot (Phi), Makrut (Tha)

<i>Citrus limon</i>	lemon	Chanh Tay / Jeruk Sitrun, J. Ponderosa, J. Khatta (Ins), Limau Mata, L. Mata Kerbau, L. Susu (Mal), Manao Farang, Manoa Thet (Tha)
<i>Citrus medica</i>	Buddha's hand	Phat Thu / Limau Jari (Mal), Som Mu (Tha), var. <i>sarcodactylis</i> fingered citron
<i>Diospyros philippin</i>	butter fruit	Hong Nhung / Buah Mentenga, Bisbul, Mobolo (Ins)
<i>ensis (D. blancoi)</i>	velvet apple	Buah Mentenga (Mal), Tabang (Phi), Marit (Tha)
<i>Eriobotrya japonica</i>	loquat	Ti Ba Diep, Son Tra Nhat Ban, Nhot Tay / Lokwar (Ins, Mal), Lo-khwat (Tha)
<i>Flacourtia rukam</i>	rukam	Mung Guan Rung / Ganda Rukem, Rukam (Ins), Rukam Manis, Rukam Gajah (Mal), Amait, Aganas, Kalominga (Phi), Ta-khop Thai (Tha)
<i>Fortunella japonica</i>	kumquat	Quat, Kim Quat, Tac / Jeruk Kumquat, Lemon Marura (Ins), Limau Jepun (Mal), Kham Khwat (Tha)
<i>Limonia acidissima</i>	wood	Can Thang / Kawista, Kusta (Ins), Belinggai, Gelinggai apple (Mal), Makhwit (Tha)
<i>Pithecellobium dulce</i>	guayamochil	Me Keo, Keo Tay / Assam Belanda, Asem Londo, Asam Manila tama-Korangi (Ins), Kamatsile, Kamachile (Phi), Makham rind Thet (Tha)
<i>Syzygium cumini</i>	Java plum	Voi Rung, Tram Moc / Jambu Jambolan (Ins, Mal), Duhat, Lumboi, Duatnasi, Dungboi (Phi), Wa (Tha)
<i>Syzygium malac</i>	Malay	Cay Dao, Cay Roi / Jambu Bol, Jamblang (Ins), Jambu cense apple Merah, Jambu Bol (Mal), Gubal, Mangkopa, Makopa, Yanbu, Tersana, Makopang-kalabaw, Samunagi (Phi), Chomphu Mamieo, Chomphu Saraek (Tha)

Table 3. Area and production of major fruits grown on seven agro-economic zones of VN

Zone	Area (ha)	Production (t)	Kinds of fruit*
North Middle Land	32,335	313,600	lychee, plum, peach, grape, orange, apple
Red River Delta	12,774	173,700	<u>lychee</u> , <u>longan</u> , banana
North Central Coast	14,430	131,100	orange, mandarin, pummelo,
South Central Coast	28,580	228,600	mango, cashew, pineapple, grape, <u>dragon fruit</u>
Central Highland	5,330	57,400	durian, rambutan, mangosteen, jackfruit, avocado, coffee, cocoa,

			sweetsop, jujube
South-East	27,060	318,000	-ditto-
Mekong Delta	204,568	2,276,300	orange, longan, sapodilla, mandarin, pumelo, pineapple, durian, mangosteen, rambutan, guava, soursop, papaya, mango.
Total	325,077	3,3442,000	

The data from the above-mentioned tables showed that Mekong river delta region is considered to have high potential for the development of major fruit species and in fact, this area produced a big quantity of fruit used in domestic consumption and exported as well. The North Middle and mountainous land ranked the second, and, though the area under fruit cultivation is now much smaller than Mekong river delta, it has also a high capability for the development of fruit crops because of land availability and diversified climate condition.

II. Vegetable development in Vietnam

Table 4: Area, yield and production of vegetable in Vietnam

No	Regions	Ha		Yield (Quintal/ha)		Production (Tons)		Compared to Gov. Plan	
		1999	2004	1999	2004	1999	2004	2010	%
	Whole country	459,6	615,8	126,0	143,92	5792,2	8863,7	550	112
1	Red River Delta	126,7	160,2	157,0	172,83	1988,9	2769,5	130	123,2
2	North Mountains	60,7	86,0	105,1	109,29	637,8	939,9	75	114,7
3	North Central Coast	52,7	68,8	81,2	93,28	427,8	641,8	60	114,7
4	South central Coast	30,9	41,4	109,0	132,99	336,7	550,7	60	69,0
5	Central Highland	25,1	44,2	177,5	196,15	445,6	867,0	35	126,3
6	South-East	64,2	60,6	94,2	101,77	604,9	616,7	70	86,6
7	Mekong River Delta	99,3	154,6	136,0	160,29	1350,5	2478,1	120	128,8

Per capita consumption of vegetable in 2003 is estimated of about 102 kg/year that is same the average one in the world whereas, 85 kg/capita/year is planed by the government of Vietnam by the year 2010.

Following is some data concerned to the development of the main vegetable crops in different regions throughout the country

Table 5: Leading crops of vegetables cultivated in Vietnam

	Cabbage		Tomato		Cucumber		Legume Vege.		Chili	
	Area (ha)	Pro. (tons)	Area (ha)	Pro. (tons)	Area (ha)	Pro. (tons)	Area (ha)	Pro. (tons)	Area (ha)	Pro. (tons)
Whole country	32,522	609,377	24,644	424,126	11,819	199,94	5,742	36,064	3,367	21,223
North Mountains	11,065	245,741	8,334	165,433	4,139	88,35	1,685	12,450	1,380	12,808
Red river delta	9,572	119,333	2,397	33,302	378	3,71	710	1,834	-	-
North central coast	2,403	34,166	1,565	12,025	673	6,47	320	2,510	1,145	5,003
South central coast	250	2,917	1,177	8,460	494	5,17	-	-	-	-
Central highlands	5,140	13,469	6,136	136,642	310	2,73	1,250	6,985	5	50
North-East	1,133	10,047	1,445	12,432	1,184	17,25	245	1,250	716	2,910
Mekong river delta	2,989	62,482	3,590	55,832	4,614	75,38	1,532	1,025	122	452

It can be considered that the production of vegetable in Vietnam has been concentrated into two main regions: Red river delta and central highlands (particularly Lam Dong province), where climatic condition and land fertility is adaptable for various species of vegetables including high value ones. Generally, vegetables in Vietnam can be cultivated in two ways of production: rotated with the other crops, mainly food ones (rice, maize...) and monoculture in the same sites (various vegetable species are planted continuously). Table 6 gives examples of 3 locations that are representatives for 3 production areas where vegetables have been commercially produced.

Table 6: Main areas of commercial vegetable production in Vietnam (examples)

Locations	Areas (ha)	Yield (tons)	Production (1000 tons)	Major spices
Hanoi (Red River Delta)	8,100	18.62	150.8	Leafy vegetables
Vinh Long (Mekong River)	643.5	0.35	0.2	Mushroom only
Lam Dong (Central Highland)	27,315	25.80	67.7	Cabbage, cauliflower...

III Orientation of the development of fruits and vegetable in coming period

1. Development of fruits and vegetable must be based on the advantages of natural conditions of the regions in which, specific and diversiform climate should be considered.
- 2.** The production must be closely linked with the consumption markets and commodities must have good competitiveness
3. The priority will be given to the production of specific species that have been traditionally cultivated in the region with high quality, productivity and benefit.
4. Strengthening the study on varietals improvement, GAP and post harvest to meet the increasing demands of the consumers