

CONFERENCE RECOMMENDATIONS FOR HORTICULTURE DEVELOPMENT OF NEPAL

One of the objectives of NHS is Support Government in designing policies, strategies, and programmes for horticulture development and implementation in Nepal. Therefore, on the last day of the conference several recommendations were made for overall development of Horticulture sector of the country. The recommendations were based on the deliberations in this conference, information available in the book named Six Decades of Horticulture Development in Nepal published by NHS, SWOT analysis results presented, experience of group members and discussion in a particular group. The Constitution of Nepal 2015 (Rights to food for every citizen of Nepal), National Agriculture Policy, 2004 and goals of ADS were also considered for making recommendations. SWOT analysis was done in Plenary Session followed by group formation for making recommendations separately on **Horticulture Research, Horticulture Extension, Horticulture Education and Horticulture Business**. SWOT analysis and group discussion was facilitated by Dr. Prahlad Thapa, Dr. Krishna P. Paudel and Dr. Umed Pun

SWOT analysis revealed following Strength, Weakness, Opportunities and Challenges in horticulture sector of Nepal:

Strengths

1. Natural Factors

- Favourable agroecological conditions to grow variety of horticultural products
- Available land
- Abundant water and forestry resources

2. Infrastructure

- Access to information and communication improving
- Transportation network - improving rural roads
- Cold storage facilities

3. Demand for Horticulture Products

- Large and growing domestic demand for – established markets
- Proximity to large and rapidly expanding regional markets

4. Institutions

- Established research stations and farms
- Academic institutions
- Strong extension network up to grassroots level
- Strong capacity of MOFALD and DOLIDAR
- Good structure and capacity of relevant departments (e.g. Dept of Industry, Dept of Cottage and Small Industry, Department of Irrigation, Department of Forests

5. Private Sector

- Private sector already in the business
- Dynamic pockets established in the private and cooperative sectors (e.g. tea, coffee, flowers, citrus, cardamom)
- A large number of grass-roots organizations (e.g. farmer groups, community forests, and cooperatives) and commodity trade organizations

6. Human Resources

- Availability of local expert knowledge on development constraints
- Availability of interested farmers

7. International

- Member of several world and regional trade organization
- Large flow of remittances
- Introduction of technologies by people working abroad

Weaknesses

1. Human Resources

- Massive youth outmigration from rural areas
- Limited pool of skilled labour and professionals in horticulture processing sector
- A large pool of illiterate farmers
- Feminization of agriculture

2. Land

- Large number of subsistence farmers with low commercialization
- Fragmented and small sized farms
- Land degradation (erosion, soil fertility, desertification)
- Underutilised and abandoned land

3. Commercialization

- Low value added and short shelf-life
- Low size and development of agro-industry and horticulture business
- Poor quality and safety of products
- Limited access to finance both for farmers and SME
- Low FDI in the sector

4. Technology

- Large gap between research station and farmers' yields
- Poor quality of service at grassroots
- Limited outreach of research and extension service providers
- Unregulated use of pesticides and antibiotics
- High incidence of pests and diseases
- Poor genetic material

- Poor mechanism for technology generation suited to different niches and needs of farmers, demonstration and adoption by farmer of new technologies at grassroot level
- Underdeveloped postharvest system

5. Trade

- Heavy dependent on India for trade
- Large and growing deficit in horticultural trade
- Non-tariff barriers to trade
- Over valuation of currency

6. Policy and Institutions

- Low investment in science and technology for horticulture
- Lack of crop insurance
- Weak coordination among horticulture related agencies
- Weak land tenure policy

7. Infrastructure

- Limited access to year-round irrigation
- Weak rural infrastructure (electricity, transport, markets, storage)

Opportunities

1. High Value Products and Value Added

- Accelerated growth of high value products including horticulture, spices, beverages, medicinal and aromatic plants
- Establishment of Nepal brands
- Certified organic production

2. Technology

- Increase in productivity
- Rural areas catching up with urban areas
- Good practices and certification in production, processing, and distribution
- Conversion of cereal land to other productive uses consistent with land use planning

3. Commercialization and Agribusiness

- Integration of smallholders with value chain
- Establishment of domestic private agrifood corporate sector
- Agroforestry development
- Attract FDI
- Mobilise remittance incomes

4. International

- Air transport linkage
- ICT
- Access to technology

Challenges

1. Land

- Reducing migration
- Rehabilitating underutilisation and degraded land

2. Policy and Institutions

- Limited commitment and leadership by government
- Persistent lack of coordination among agencies at the central level, at the local level, and between central and local level.

3. Technology

- Mechanisation to solve labour shortage issue
- Access to technology in rural areas

4. Climate Change and Biotic Factors

- Disasters associated to climate change
- Emerging pests and diseases attacks

5. International

- Price hikes in energy
- Stiff competition

Conference Recommendations

Group discussion followed by plenary session discussion made following recommendations:

1. Horticulture Research

SN	Activities	Recommendation	Time
1	Formation of National Horticulture Research Authority (One door system) under GoN	To guide overall horticultural research and take necessary actions	2017
2	Formulation of National Horticultural Research Policy	To guide overall horticultural research inside the country	2018
3	Establishment of Horticultural Excellence Center in all states	To demonstrate the recent technologies	2020
4	Human Resource capacity building in Horticultural Research	Training Center on Horticulture, collaboration and exposure with international communities and universities	2018
5	Establishment of Horticultural Research station in all states	with emphasis to niche specific horticultural commodities	2020
6	Infrastructure Development for Research	Hi-Tech molecular laboratory	2020
7	Establishment of Large Cardamom Center of Excellence	No. one exporter country of Large cardamom	2020
8	Establishment of Coffee, Tea and MAPS Center of Excellence	Decided by the authority of Horticulture	2019

9	Increase budget allocation in Horticultural research	Sufficient budget allocation	2017
10	Value addition to the horticultural products	Establishment of National Post-harvest Center	2020
11	ODOP promotion (PPP approach)	Outreach research program and on-site demonstration of developed technologies, verification trials	2016
12	Research on indigenous horticultural commodities including underexploited and unexploited commodities	Rhodendron, Orchid, local fruits and nuts genetic resources, vegetables	2018
13	Horticultural commodity based research in different agro-ecological farms (both under NARC and DoA)	Niche specific	2018
14	Infrastructural development to every DADO with some areas as model farm	Lab facility	2018
15	Infrastructural development of horticultural research system including NARC	Well equipped lab and farm resources	immediate
16	Problem and need based research for higher studies in UG and PG and other basic research in integrated form (involvement of NARC, DADO and university)	as guided by the authority of horticulture	2017
17	Quality manpower enrollment in agricultural universities and NARC through PSC	No politicization	immediate

2. Horticulture Extension

1. Establishment of Horticulture Department under MoAD
2. Strengthening and upgrading of resource centres
(Upgrading of resource farms)
 - Manpower (SMS for specific field)
 - Supply of quality sapling/seed
Nursery act should be formulated and implemented for quality control
 - Target specified e.g. Commodity based
3. Linkage of private entrepreneurs with public institutions
4. Strong coordinated linkage among I/NGOs, private sectors, extension, education and research centres
5. Package of Practice (POP) for specific commodity for specific area
6. Target area should be fixed for specific commodity
7. Agriculture University and NARC should have extension wing
8. Increase in coverage of extension 15% to 30% by 3 years)
9. Credit and input facilitation
10. Demonstration and farmers field day
11. Quality vegetable seed production and certification
12. Horticulture graduate students should be assigned for on the job training at least for 3 months at different farms

13. Target should be defined for extension office for production and productivity of the specific commodity (e.g. tea, coffee, zinger, banana, cardamom, apple mandarin etc)
13. Facilitate mechanization (subsidy and maintenance)
14. Promotion of private service providers (provide training, exposure visit by DADO)
15. Establish market linkage and facilitate market
16. Allow national and foreign investors in commercial production industry/export promotion
E.g. bank access, subsidy, security etc. based on production and export
17. Market centres should be developed with cold storage, model pack house, collection centres, processing centres
18. Cold chain movement of horticultural product should be initiated
19. Facilitate for processing and value add production
20. Safe food production
 - Pesticide analysis in each fruit and vegetable whole shale market
 - Organic production, Good Agri. Practices (GAP)
21. Support to model pact house
21. Value based insurance
22. Strong linkage between I/NGOs, private sectors, extension, education and research institution
22. Information and communication technology in agriculture by advance technology

3. Horticulture Education

SN	Recommended action points	Time frame
1	Short term advanced professional training eg. Floriculture, post-harvest processing, Off-season production	2 years
2	Course on agribusiness promotion	2 years
3	Setting uniform criteria for opening/affiliating agriculture collage and monitoring mechanism for quality of agriculture education	1 years
4	Higher education related research should be tied up with research and extension related farms	1 years
5	Fellowship opportunities for in countries research by MoAD	4 years
6	Specific post graduate degree provision (M.SC Hort(pomology), M.SC. Hort(Olericulture) etc and recognized by PSC/TU	5 years
7	Horticulture focus training center at different agro-ecological region	5 years
8	Deemed to be university from NARC which provides higher research degree providing fellowships	1 year
9	Agriculture Education Policy leading to formation of Nepal Agricultural Education Council	3 year
10	Soft loan to agriculture graduate to start up agri-bussness on his/her own	2 years
11	Cutting edge teaching and resarch need of country be fulfilled by capacity building of university manpower and should be reflected on research graduate teaching	5 years

4. Horticultural Business

SN	Recommended action points	Time frame
Policy		
1	User friendly and relaxed policy for technology/input import (tedious and time consuming)	3 years (2018)
2	Enlist the inputs (70% for agriculture use) into agriculture commodities-privilege should be given	3 years (2018)
3	Anti dumping tariff and non-tariff barriers(strict implementation of quarantine)	1 year (2016)
4	Set Standard product import policy	3 years (2019)
5	Formulation of Commission for high value commodity with all stakeholders	1 year (2016)
6	Govt. investment on most appropriate technology- buy patented varieties of fruits / build conducive investment environment for foreign companies	1 year (2017)
Farming		
7	No clear research policy document	1 year (2016)
8	Increase indirect subsidy upto25%	1 year (2016)
9	Industries should use 25% indigenous products	1 year (2016)
10	Land consolidation law and regulations	1 year (2016)
11	Clear policy document for horticulture (linkage with business)	2 years (2017)
12	Access of user friendly technology information (evaluation of researcher based on usage by users)-ICT	1 year (2016)
13	Provision of embedded service (technical, financial) by agribusiness	1 year (2016)
Output/Market		
14	Output subsidy (25%)	2 year (2017)
15	Certification cost by Govt for short term for organic products	2 year (2017)
16	Branding of export commodity	2 year (2017)
17	Market research on competitive products	3 years (2018)
18	Business governance : strictly remove multiple tax system	1 year (2016)
19	Study on cold storage requirement for high value export commodities and Build cold storage for high value crops at international airports through soft loan	1 year (2016)
20	Provision of soft loan for young entrepreneurs	2 year (2017)

Annex - IHC Schedule

First International Horticulture Conference, 2016

8-11 April 2016, Kathmandu, Nepal

Day 1 (08 April. 2016) : Arrival of Participants and Conference Inauguration

Activity	Time
Arrival of delegates (Airport pickup)	
Registration	3.00-4.30
<i>Tea/Coffee</i>	4.00-4.30
Guests invited to the dias	4.45-4.55
Felicitation to Chief guest and guest of honor: Khada, bouquet and pin	5.00-7.00
Welcome	5.00-5.05
Conference objectives	5.05-5.15
Horticulture in Nepal: Journey in last six decades (ppt presentation): Shiva Bahadur Nepali Pradhan and Ram Badal Shah	5.15-5.25
Keynote presentation from ISHS	5.25-5.50
Memento Presentation to Past Presidents of NHS and eminent horticulturist	5.50-6.10
Horticulture Development in Private Sector: Bhawani Rana	6.10-6.20
Horticulture Development in Public Sector: Yogendra Kumar Karki	6.20-6.35
Book Release: Six decades of Horticultural Development in Nepal	6.35-6.45
Remark from Chief Guest	6.40-7.00
Vote of Thanks	7.00-7.10
<i>Dinner</i>	7.10-9.00

Day 2 (09 April. 2016) : Presentation of Thematic Papers**Session I**

Chair Person: Shiva Bahadur Nepali Pradhan

Activity	Time	Responsible Persons
Horticultural Research in Nepal: Achievement and future strategy	10.00-10.15	Crop and Horticulture Research Director, NARC
Fruit Crop development in Nepal: Achievements and future strategy	10.15-10.30	Program Director, FDD
Vegetable Development in Nepal: Achievements and future strategy	10.30-10.45	Program Director, VDD
Horticulture Education in Nepal: Achievement and future strategy	10.45-11.00	Dean, AFU
<i>Tea Break</i>	11.00-11.15	
Fruit industry in Nepal	11.15-11.30	Khom Prasad Sharma
Vegetable industry in Nepal	11.30-11.45	
Flower industry in Nepal	11.45-12.00	Lok Nath Gaire
Agriculture education: A private prospective	12.00-12.15	Dr. B. Rajbhandari
Chairperson's remarks	12.15-12.20	

Session II

Chair Person: Mr. Javed, Director, SAARC

Activity	Time
Status of Horticulture in India	12.20-12.35
Status of Horticulture in Pakistan	12.35-12.50
Status of Horticulture in Bangladesh	12.50-1.05
Status of Horticulture in Sri Lanka	1.05-1.20
Status of Horticulture in Bhutan	1.20-1.35
Status of Horticulture in Nepal	1.35-1.50
<i>Lunch</i>	1.50-2.00

Session III

Chair Person: Dr. T N Shrestha

Activity	Time
FAO	2.00-2.15
UNDP (MEDEP)	2.15-2.30
JICA	2.30-1.45
IDE	2.45-3.00
HELVETAS	3.00-3.15
Chair Person's Remark	3.15-3.25
<i>Tea Break</i>	3.25-3.40

Session IV

Chair Person: Dr. Laxman Pun

Activity	Time
CEAPRED	2.00-2.15
FORWARD	2.15-2.30
LIBIRD	2.30-2.45
RRN	2.45-3.00
ECARDS	3.00-3.15
Chair Person's Remark	3.15-3.30
<i>Tea</i>	3.30-3.45

Session V

Chair Person: Prof. Gyan Kumar Shrestha

Activity	Time
AEC	3.45-4.00
Chair Person's Remark	5.15-5.30

Day 3 (10 April 2016)

Plenary Session

Activity	Time	Presenter
Biotechnology of papaya (<i>Carica papaya</i> L.)	9.30-10.00	Prof. Dr. Roderick A. Drew
Closing Remarks		

Session I (Technical Papers: Fruit Crops)

Chair Person: Mr. Bhairab Raj Kaini

Activity	Time	Responsible Person
Mass rearing and release of <i>tamarixia radiata</i> for asian citrus psyllid suppression in California, USA.	10.00-10.10	Raju Pandey
Non-invasive quality assessment within the fresh fruit supply chain	10.10-10.20	Bed Khatiwada
Influence of physical and chemical treatments on post-harvest quality of litchi Cv. Mujaffarpur	10.20-10.30	Rajib Kumar Yadav
Prospects of table grape industry in warm climates of Nepal	10.30-10.40	KC Dahal
Characterization of guava cultivars and landraces of Nepal	10.40-10.50	Arjun Kumar Shrestha
Mango quality determination using destructive and non-destructive ripening indicators	10.50-11.00	U. K Acharya
Chair Person's Remark	11.00-11.10	
<i>Tea</i>	11.10-11.25	

Parallel Sessions (Hall 1)

Session II (Technical Papers: Vegetables)

Chair Person: Prof. Dr. D R Baral

Activity	Time	Responsible Person
Comparative Study on the Efficiency of Chemical Fertilizer, Farm Yard Manure, Cattle Urine and Jiwamrit cum mulching on Radish Seed Crop	11.25-11.35	T.B. Poon
Reduction in Postharvest Loss of Cauliflower by Adapting Appropriate Handling Technology	11.35-11.45	D.M. Gautam
Evaluation of iron slime as soil amendment for raising cabbage	11.45-11.55	S P Vista
Utilization of Vast Tract of Riverbed Areas with Appropriate Farming Technology	11.55-12.05	Hari Gurung
Tomato Improvement for Fruit Quality and Disease Resistance with Integrated Approach at NCSU: An Overview	12.05-12.15	Dilip R. Panthee
Effect of Genotypes and Spacing on Processing quality Tuber Production of Potato in mid hill and inner terai of Nepal	12.15-12.25	Ishwori Prasad Gautam
Chair Person's Remark	12.25-12.35	
<i>Tea Break</i>	12.35-12.50	

Parallel Sessions (Hall 2)

Session III (Technical Papers: Vegetables)

Chair Person: Dr. K.P Paudyal

Activity	Time	Responsible Person
Evaluation of okra (<i>Abelmoschus esculentus</i>) genotypes for okra yellow vein mosaic virus in western terai of Nepal.	12.50-1.00	Ram Bahadur Khadka
Evaluation of cumin (<i>Cuminum cyminum</i> L.) genotypes at different agro-ecological domain of western Nepal	1.00-1.10	Ranjana Rawal
Biocontrol Efficacy of <i>Trichoderma</i> spp. Against Phytophthora Blight of Pepper	1.10-1.20	R.D. Timila
Horticultural practices in organic and conventional commercial vegetable farms in Kathmandu valley	1.20-1.30	Gautam Shrestha
Value chain analysis of 'Shrijana' tomato seed in Nepal	1.30-1.40	Dinesh Babu Thapa Magar
Performance of Commercial Hybrid Tomato Cultivars in Cocopit and Rockwool Substrate Media in Green House Condition	1.40-1.50	Surendra Lal Shrestha
Chair Person's Remark	1.50-2.00	
Lunch	2.00-3.00	
Poster Session	3.00-3.30	

Session IV (Technical Papers: Ornamentals and Cross-Cuttings)

Chair Person: Prof. Dr. D.M. Gautam

Activity	Time	Responsible Person
Vaselife analysis of gladiolus using different vase solutions	3.30-3.40	P. Mishra
Effect of pinching and levels of gibberellic acid on plant growth and yield of African marigold (<i>Tagetes erecta</i> L.)	3.40-3.50	H. P. Pandey
Petal color fading and wilting, symptoms of petal senescence is differently regulated in cut <i>Tweedia caerulea</i> flowers	3.50-4.00	K. Ichimura
In vitro study of <i>Dendrobium</i> and analysis for homogeneity by using RAPD	4.00-4.10	Sabita Dhungana
Organic wastes to alternative fertilizers: Opportunities and issues for commercial scale of waste recycling and its application to horticulture industry in Nepal	4.10-4.20	Surya P Bhattarai
Managed honey bee pollination: Present and future need to enhance the productivity and quality of horticultural crops in Nepal	4.20-4.30	Khem Raj Neupane
Chair Person's Remark	4.30-4.40	

Poster Presentation

Activity	Responsible Person
Effect of sucrose levels on postharvest life of cut roses (CV. Dutch Hybrid) in Chitwan condition.	S. Sharma
Effect of silver nitrate (AgNO ₃) on vase life of gerbera (Gerbera jamesonii var. Red Explosion) cut flower.	S. Thapa
Effect of Hydroxyquinoline sulfate (8-HQS) on vase life of Gladiolus (Gladiolus communis var. American beauty) in Chitwan condition.	R. Aryal
Composting and vermicomposting of poultry litter using Eisenia foetida earthworm species: A comparative study	T. N. Joshi
Assessment of soil fertility status and preparation of their maps of Horticulture Research Station, Malepatan, Nepal	Dinesh Khadka
Field identities of different species of fruit flies in sweet orange (Citrus sinensis) orchards in Sindhuli, Nepal	D. Adhikari

Day 4 (11 April 2016) : Workshop on strategy for development of horticulture in Nepal and closing

Session I

Chair Person: Prof. Gyan Kumar Shrestha

Workshop facilitator: Dr. P Thapa/Dr. KP Poudyal

Activity	Time
Welcome and Purpose of workshop	8:30-8:35
Presentation	8:35-9:00
Participants divided into thematic groups	9:00-9:15
Group work	9:15-10:15
Group presentation	10:15-10:55
Preparing road map	10:55-11:25
Presenting outcome of workshop	11:25-11:40
Chairman's remark	11:40-11:45
<i>Lunch Break</i>	11:45-12:40
<i>Tea Break</i>	1:30-2:00

Session II : Workshop Declaration and Closing

Chairperson: Secretary, MoAD

Activity	Time
Workshop Declaration	12:45-1:00
Closing ceremony	1:00-1:30

Session III

Chairperson: NHS President Mr. Mohan Bahadur Thapa

Activity	Time
AGM of NHS	2:00-4:00