

An Analytical study on Food Safety Issues in Different Stages of Vegetable Production from Farm to Table



1.Introduction

- **Myanmar**

677,000 square kilometer; 59.13 million in 2011

avg. growth rate=1.29 % ;

economy is chiefly agro-based and 60 % of the total labor force

- **Agriculture Sector (Objectives)**

Priority to fulfill the needs of local consumption;

Export the surplus of agricultural products to earn foreign exchange;

Assistance to rural development through agricultural development





1. Introduction (continued)



Vegetables in Myanmar

- ❖ Different climatic conditions favorable for growing over 100 varieties of vegetables in Myanmar
- ❖ Produce in short time, quickest ways of increasing food security
- ❖ Important sources of food contain nutritional value (vitamins, minerals, fibers, carbohydrate and protein)



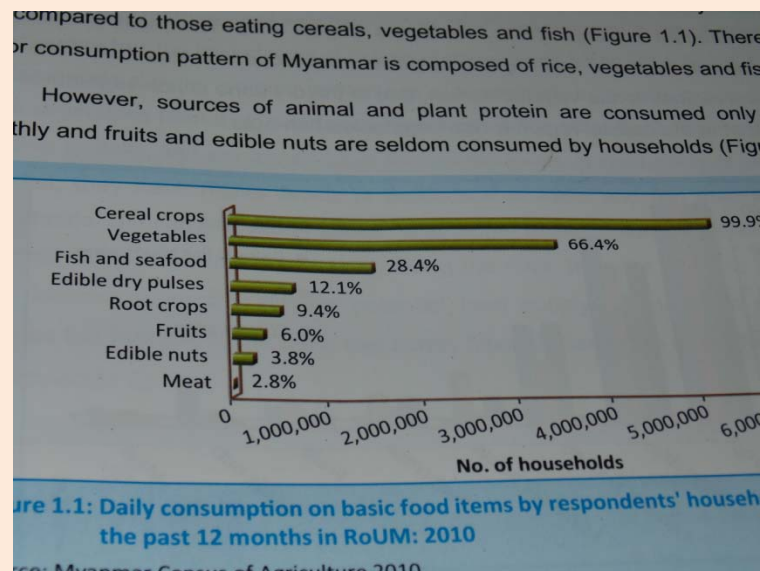


1. Introduction (continued)

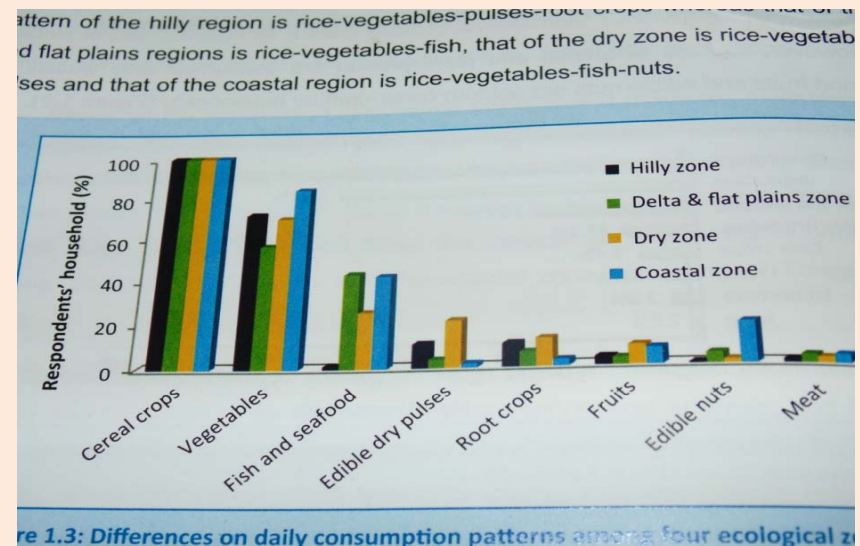
Current vegetable consumption of vegetables in Myanmar

(Zaw Aye Moe, 2013)

Daily consumption



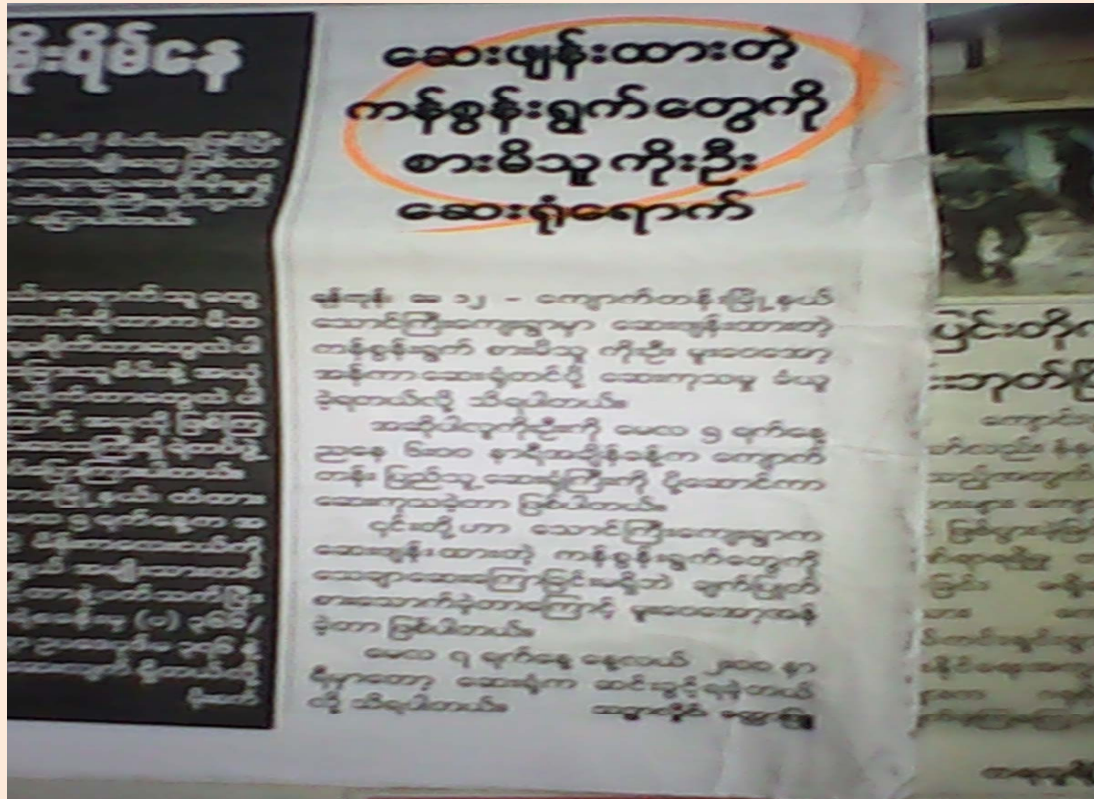
Consumption in different ecological zones



1.Introduction (continued)

- ❖ For increased population
- ❖ For largest consumption after rice & cereals
- ❖ For developing of export market potential
- ✓ Production of safe and quality vegetables is essential





Nine people from Yangon region were sent to hospital due to pesticide toxicity by eating sprayed water cress without washing well before eating. (Weekly News Journal-May, 2013)

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❖ A farmer died due to blowing nozzle while spraying pesticide in tomato plot (Mirror daily newspaper, 12 Sept, 2013)

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Difficult to purchase safety food.
(Mirror daily newspaper, 01 November, 2013)

1.Introduction (continued)



- urban farmers growing vegetables in Yangon area
- never received any support from any organization



- consumed by Yangonians
- using pesticides without knowledge
 - -weak in selection of appropriate pesticide with PHI (Pre-Harvest Interval)
 - -not systematic spraying habit

2.Overall objectives

- To find out current condition of vegetable production in its food supply chain mainly on free from chemical residues (food safety) around Yangon by surveying the vegetable growers in outskirts Yangon; suppliers, sellers from local markets and super markets, and consumers of local markets nearby the production places.



2. Specific objectives



- ❖ To suggest better and safe ways for getting vegetables free from residues of agrochemicals (to improve production for food safety);
- ❖ **To plan awareness programs & trainings by highlighting the misuse of agrochemicals in current vegetable production to protect from hazards for farmers, consumers, and their environment;**
- ❖ To improve current vegetable supply chain for consumers' health
- ❖ **To present suggestions for concerned organizations to manage better situation of vegetable food safety issues.**



3. Research Methodologies



- (1) **Review of literature** and other relevant documents to get an overview of food safety issues in vegetables in parts of Myanmar that are were not directly covered by methodology 2.
- (2) **Surveys** conducted with 180 vegetables growers; 84 retailers, 18 wholesales, 18 transporters and 30 consumers along the supply chain.
- (3) Focus Group Discussions (**FGDs**) with responsible persons from Plant Protection Division, Vegetables and Fruits Research and Development Center and Golden Key & Diamond Star Agrochemical Companies, mail contact with NGOs like MercyCorps and Golden Plain.
- (**Direct observations** were made during survey to the different groups along the supply chain, and took **photos to record** their practices and situation in survey area).

3. Research Methodologies (continued)

- Firstly, selection of survey team and training for them were conducted
- Then, prepared survey forms based on standard plant protection procedures and ASEAN GAP from literature



3. Research Methodologies (continued)



- ❖ **Questions for farmers** were
 - Farm Practices
 - Utilizing of agro-chemical according to the instruction of DoA
 - Harvest time of a day for vegetables and harvest system
 - Post-harvest handling for preparation to market
 - Awareness and knowledge for food safety, health, and environment

- ❖ **Questions for the retailers** with traditional selling and selling system at super markets were
 - Purchase of vegetables from wholesalers and transportation system
 - Equipment and material for handling and grading.
 - Decoration for selling vegetable
 - Storage and dispose waste system
 - Knowledge and awareness you safety and quality maintenance for fresh produce.

3. Research Methodologies (continued)



Study areas

- Farmers-Thngankyun, Mayangone, Mingaladon, Th
Thanlyin,
South & North Okkalapa, Tontay in Yangon Region and Paung
Tae Township in west Bago Region.
- Wholesalers, transporters, retailers and consumers: project
had chosen relevant Township City Development markets and
Thirimingalar, a large whole sale market of Yangon.
- Three supermarkets (***City Mart, Capital Diamond Star, and
Super One***) in Yangon were also selected to study storing and
preparing of fresh vegetable for retail sale.
- Restaurants (18) were also chosen for storing, handling and
preparation of vegetable to cook and serve to the consumers.
- ❖ Four groups of research teams have supported with one
another within surveying period.
- ❖ Research team also delivered manual booklets and knowledge
sharing papers to vegetable growers and consumers.

4. Findings

(From secondary data)

Major vegetables & production in 2011-12

S.N	Vegetables	Sawn Area (Ha)	Yield (MT/Ha)	Production (MT)
1.	Cabbage	32,337	14.57	471,235
2.	Cauliflower	26,609	12.54	333,780
3.	Lettuce	10,655	6.99	74,461
4.	Mustard	37,958	7.79	295,806
5.	Tomato	107,457	11.95	1,284,240
6.	Beet of beet root	2,758	9.35	25,796
7.	Radish	22,731	12.34	280,457
8.	Watermelon	16,571	12.95	214,676
9.	Bottle gourd	22,767	11.14	253,572
10.	Asparagus	502	4.52	2,270
11.	Others	257,650	-	-

Source: MoAI (2012)

4. Findings **(From secondary data)**

Importance of vegetables

Nutritional aspects

Socio-Economic aspects

Consumption of Vegetables

Unsafe and Ineffective Pest Management

Current status of Vegetable Research and Development

Challenges and Constraints

GAP Guidelines

Food Quality and Food Safety

Food safety hazards

Major causes of quality loss after harvest

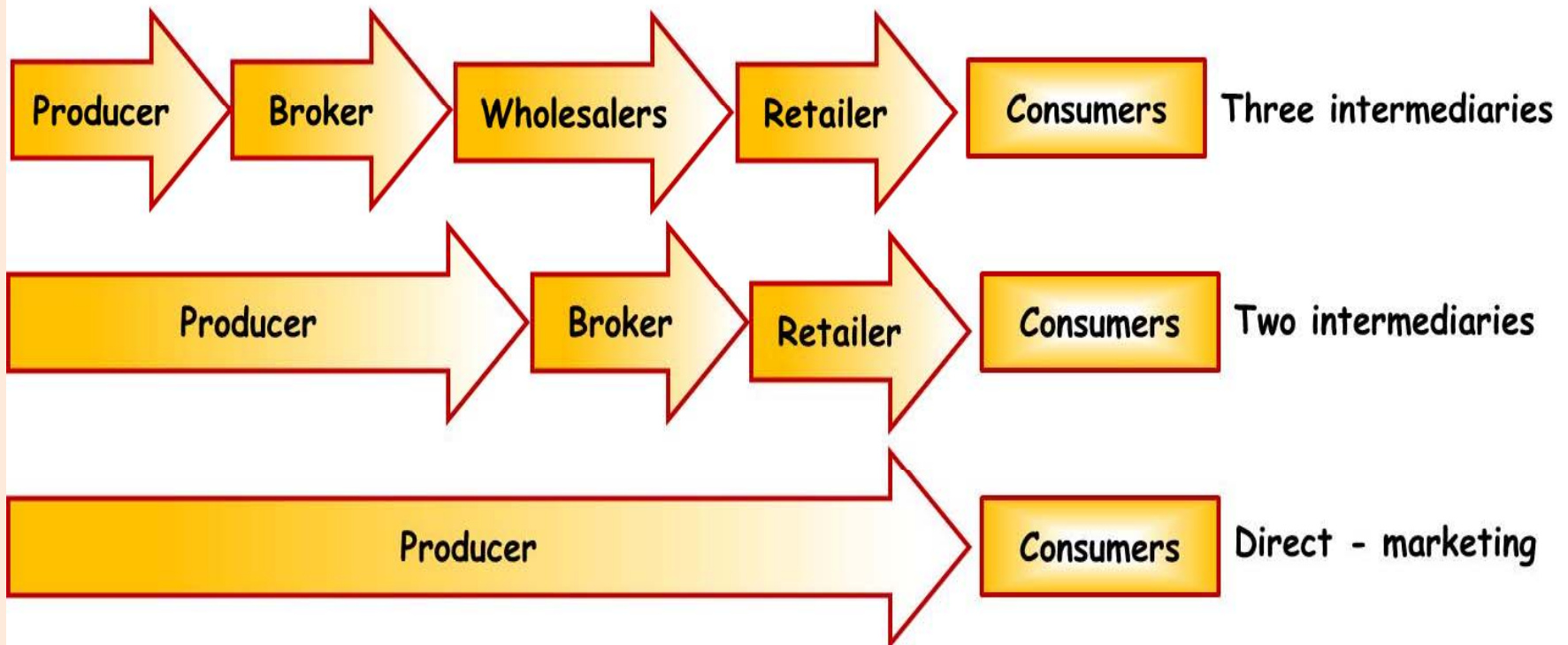
Activities of Myanmar GAP

Food Safety Regulations



4. Findings (From Farms)

Commonly Practiced Supply Chain in Survey Area



4. Findings (From Farms)

- All farmers used chemical fertilizers and pesticides excessively. But most of them has lack of knowledge and though they had long experience in vegetable growing
- Most kind of pesticides were not legally approved and they were not described with Myanmar language
- 80% of farmers were not using with suitable protective clothing and equipment for pesticides
- None had been trained for the using of sprayers and pesticide, and personal hygiene practices.
- About 10% of growers stored in a secure area away from fresh produce



4. Findings (From Farms)

- All of them dispose the agro-chemicals incorrect way.
- Water applying for vegetable production was not clean.
- 90% of farmer did not use label to notice chemical storage area.
- Then had no production records and very less knowledge in post-harvest practices.
- Most of the workers are family members and some were employees of large formers who had lack of awareness and less hand washing habits.



4. Findings (From Farms)

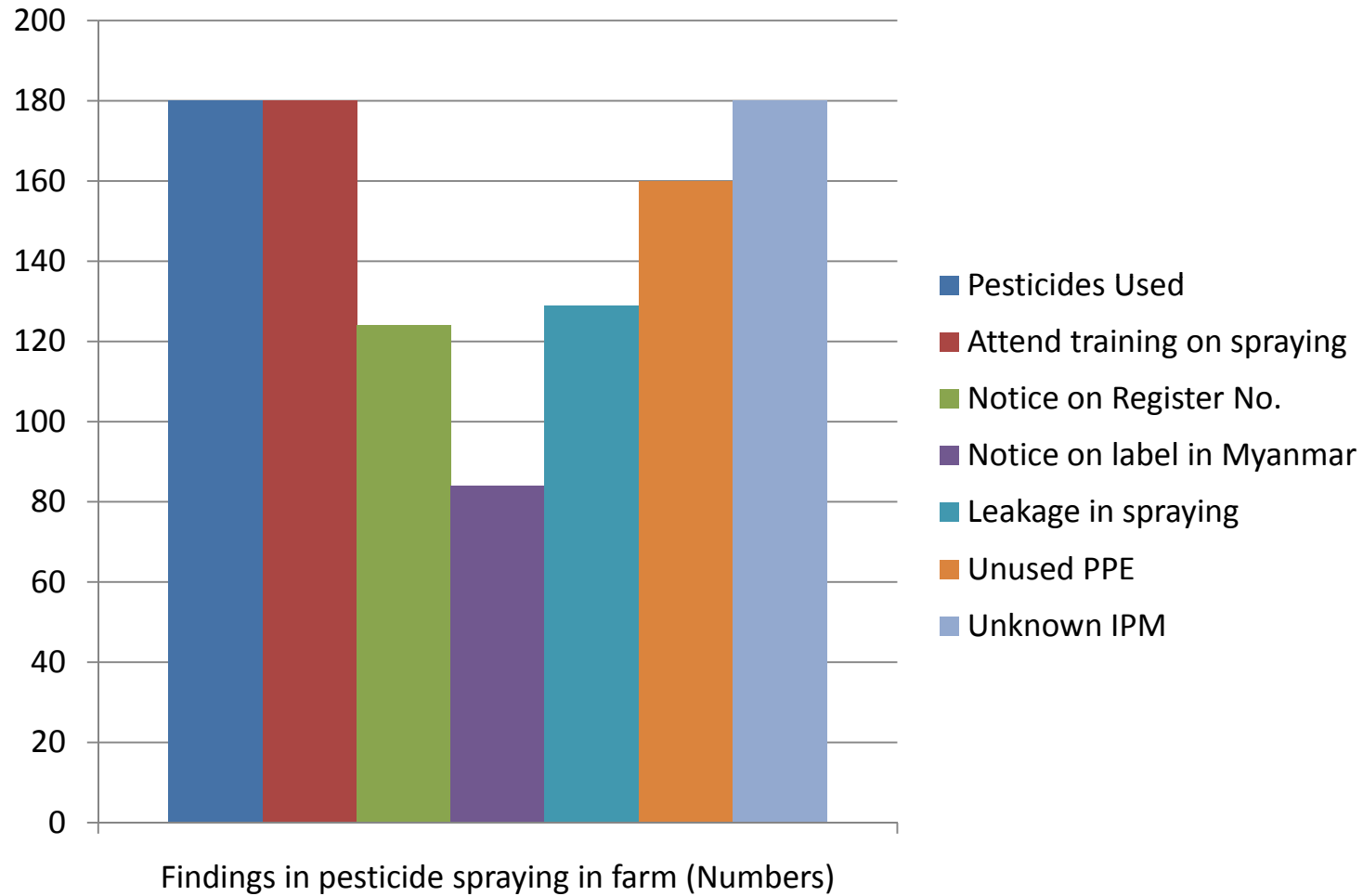


Fig.3 Negative findings from pesticide spraying in farms

4. Findings (From Farms)



❖ During harvesting

- workers use rough handling for the product.
- **Picking containers like bamboo basket and plastic containers were unclean and over-packed.**
- Vegetables were stocked in loose heaps on the ground.
- **Some produce were exposed to sun.**





4. Findings (From Farms)



❖ During preparation to the market by farmers (Post-Harvesting)

- Grading was doing in farm compound without using under cover which found in every area.
- Workers were walking through the heaps of vegetables with footwear.
- All were not trained and lack of personal hygiene.
- All farmers had lack of knowledge to control to prevent contamination of chemical, physical and biological hazard.
- Vegetable like bottle gourd, egg plan, cauliflower, mustard and cabbage were cause injuries while carrying with bamboo baskets and bamboo trays without liner such as banana leaves or paper.
- All farmers did not use suitable package for the produce.



4. Findings (From Farms)



❖ During preparation to the market by Retailers

- Grading was doing in house compound without using under cover were found in every area.
- Some retailers use under cover while produce were selling.
- Family members were walking through the heaps of vegetables with footwear
- All were not trained and lack of personal hygiene.
- All retailers had lack of knowledge to control to prevent contamination of chemical, physical and biological hazard.
- Vegetable like bottle gourd, eggplant, cauliflower, mustard and cabbage were cause injuries while carrying with bamboo baskets and bamboo trays without liner such as banana leaves or paper.
- All retailers did not use suitable package for the produce.

4. Findings

(from Interviews with wholesalers and observed the warehouse)

- Workers are not well trained.
- Do not use appropriate containers.
- Heaping vegetables directly on the ground.
- Injuries were caused because of heaping vegetables on ground & in rough baskets.
- Big bamboo basket without liners.
- Without regular clean the warehouse.
- Using with rough handling during loading.



4. Findings

(from studying the supermarkets and consumers)

- Workers were packing and hold produce under the shed.
- Some special workers are trained.
- All supermarkets used packing equipment and tables and washed with clean water.
- All workers avoid using equipment that had excessive drops on rough surface.
- The consumers in urban area had more knowledge in health than the rural consumers.
- Use clean water and clean preparation for cooking.
- All in urban area know the nutritional value of vegetables.



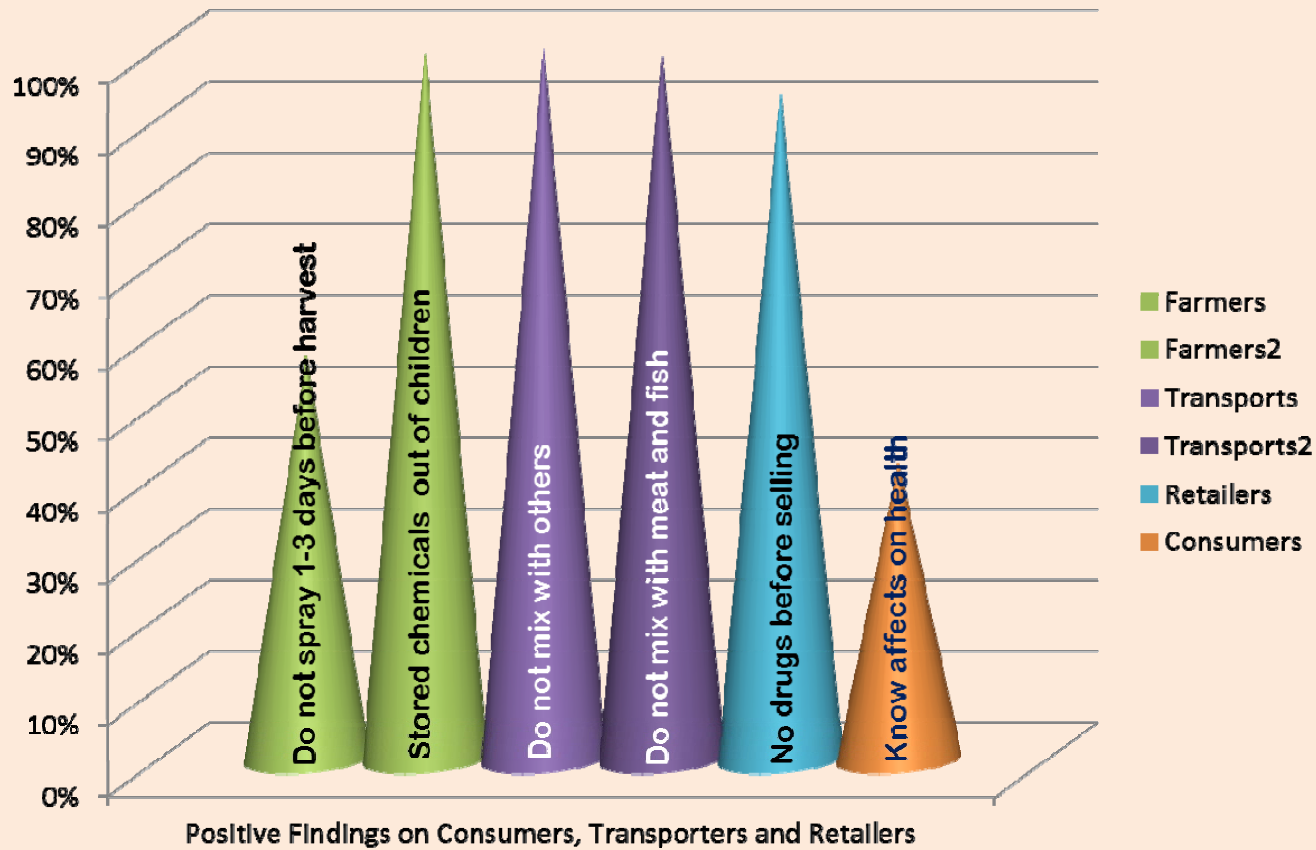
4. Findings

(from interview with transporters)



- Untrained workers for loading vehicles.
- Less of using covered in vehicles.
- Without using temperature controlled chambers suitable for the produce.
- Mixing with non-compatible produce.
- Rough handling during loading and inappropriate stacking.
- Lack of awareness of transportation system to follow GAP.

4. Findings



Positive findings on farmers, consumers, transporters and retailers

5. Findings (Observations)



5. Findings (Observations)



Preparation to the Market by
Growers and Retailers

5. Findings (Observations)



Incorrect Practices of
Transportation

4. Findings (from Key Informers-FGDs)

❖ FGD at VFRDC

Key persons met

- Project Director
- Asst. Director
- Dy staff Officer
- Dy staff Officer

Discussion points:

- **Vegetable Safety**
- **Role of VFRDC in Vegetable growing From States and Regions.**
- **Integrated pest management for farmers and plant protection materials for organic farming.**
- **Comments on current Vegetable growing & pesticide usage in Myanmar**
- **Trainings for INGO, CBOs from FSWG**



4. Findings

(from Key Informers-FGDs)

FGD at Plant Protection Division (PPD)

Key persons met

- Deputy Director General of DoA
- Director of PPD
- Deputy Director from PPD
- Head of Pesticide Registration Board Section, PPD
- Staff Officer of Pesticide Analysis Laboratory Section, PPD

Discussion points:

- **Registration**
- **Myanmar Label**
- **PHI should be described clearly and bigger font size**
- **Material grantee**
- **Crop records**
- **Weak in chemical residue analysis**
- **Law enforcement is still weakness**

4. Findings

(from Vegetable Production Projects-NGOs)

- 21 Kinds of vegetable in project
- Place of growing site Home compound
- Size of the plot... 0.2 acre
- No. of growers >50
- use vegetables for home consumption + selling
- Pesticide usage Yes
- **Farmers know PHI (pre-harvest Interval) Yes**
- **Use pesticides on crops before harvest to 7 days**
- **Farmers follow the dosage instruction on pesticide bottles Yes**
- Farmers
 - **drink or eat while spraying No**
 - **have training on spraying Yes**
 - **thoroughly wash with soap after spray Yes**
 - **store chemicals at near house?**
 - **mix chemicals with water in farm**
 - **know MSDS (Material safety data Sheet) No**
 - **know pesticide register No.** No
 - **use sprayers with leakage Yes**
 - **have protection equipments while spraying No**
 - **dispose empty bottles in farm**
 - **let his family to spray Yes**
 - **face pesticide resistant problems farmers don't know it**

5. Conclusion

- According to the findings from the research, effective and safety use of pesticide training is urgently required for vegetable farmers from Yangon.
- Feedbacks from the INGOs, and discussions with key informers from different organizations also highlight similar training is essential for vegetable growers around Myanmar.
- Fruits and vegetable production with GAP in Myanmar have been introduced by Myanmar Agriculture Services, must be increased for wide education and technology transfer not only to rural farmers but also to private sector.
- An effective capacity building program or GAP is needed critically now and should be continued to be essential in the future.

5. Conclusion

- Whole sale markets are overcrowded, dirty and lack of facilities for loading and unloading. Better wholesale market facilities must be provided by city development committee in relevant townships.
- Retailers and wholesalers must be emphasized the personal hygiene by their selves and for their workers.
- Cooperative societies of vegetable farmers and micro finance program must be provide to encourage the livelihood of vegetable farmers in Mass production areas.



5. Suggestions



- Pesticides must be sold together with PPE (Pesticide Law)
- **Issue of over-dose applications may be due to pesticide resistance or ingredients consist of chemical products, and it should be solved urgently (PPD from DoA and chemical dealers)**
- Selection of correct/appropriate pesticide to crops especially for vegetables must be easy.(Clear PHI on label-Pesticide Law)
- **Handy chemical analysis kits should be arranged for farmers, PPD & FDA staff. (DoA, Ministry of Health)**
- Keeping **Crop Record Books** must be started. First in Research Centers & YAU, and then practice until to farmers. (MoAI, then BY Law)

5. Suggestions



- Transportation of vegetables to faraway places/cities should be encouraged to use by cars with cold chambers for food security & food safety.
- **Research on vegetable safety and postharvest issues should be done more for consumer safety and exports. (DAR, YAU, FDA)**
- Education programs for vegetable safety especially for effective & safety use of agrochemicals (including selection of appropriate chemicals) should be done with correct & attractive programs via media. (MOAI & Ministry of Information)
- **Vegetable Production Cooperatives should be form in the villages where are producing plenty of vegetables, and have to support investments, GAP messages, value-added practices, food preservation, and vegetable postharvest technology. (MOAI, Ministry of Cooperative)**
- Consider to support vegetable farms in schools. Now agriculture is a compulsory subject in schools. (Education, & Agri ministries, NGOs, Agri Business Companies)

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- We are greatly indebted to all respondents and participants such as vegetable producers in eight townships of Yangon Region and one township of Bago Region, wholesalers and retailers at selected markets, transporters and consumers. The research study would not be possible without their corporation and contribution. All of them including SkyNet team gave a lot of time despite their busy schedules.

The Research Team

THANK YOU

Happy New Year

