

**WORKSHOP: VALORISATION OF TRADITIONAL PROCESSING OF INDIGENOUS AND UNDERUTILISED FRUITS**  
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**OVERVIEW OF FRUIT PROCESSING IN CAMBODIA: CURRENT STATUS AND FUTURE PROSPECTS**

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**Outline**

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- Overview on Food consumption and Dietary Habit in Cambodia
- Principal source of fruit processing
- Research and Challenges for nutritional fruits
- Conclusion

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**Country profile**

**Land use patterns**

- Population: 14 millions (NIS, 2011)
- 80% of population: Agriculture based
- No any statistic data about Fruit processing or indigenous fruits

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**Country profile: Food consumption statute**

**Food consumption (g/person/day)**

- Cooked rice: 823 g/person/day
- Vegetable: 250 g/person/day
- Fruit: 145 g/person/day
- Meat and poultry: 75 g/person/day
- Fish: 75 g/person/day

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**Country profile: Food consumption**

Cambodia:

- Stable food: Rice and fish
- Population like to eat vegetable (98% : 250 g/day)
- Fresh Fruit: less consumption in Cambodia (only 55%) consumed fruit about 145 g/day) due to their high price.
- The preference fruits consumption: seasonal fruit

**Mainly micronutrients inadequate: irons, Calcium and vitamins (vitamin A) (In et al., 2012)**

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**Country profile: Food consumption**

As the other Asian country: cooking habit of Cambodian population use a lots of herbe and spice.

➔ **Perhaps the diet contains protective factors for several chronic diseases?**

**Eating habits are not yet adapted to Western countries (less meat and fat) (In et al., 2012).**

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## Domestication fruits in Cambodia



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## Fruits Processing in Cambodia

SMEs products in Cambodia



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## Banana

- Rich in phenolic compounds and flavanoid (riche in dopamine).
- Pulp is rich in Vitamin A (Beta-carotenoid), B-Vitamins (thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, folic acid) and ascorbic acid.
- Potassium is most abundant edible portion of banana, followed by magnesium, calcium, and phosphorus.
- Due to its nutritive value, processed banana when accompanied with some legume based products, an be served as excellent baby food and snack food.



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## Banana

In Cambodia:

- Banana production is very abundant and cheap;
- Most production area is in Kampong Cham, Battambang (Source MAFF),...
- Ripe banana: Mostly eat fresh
- Unripe banana: grill and use for the cooking (also banana flower);
- Processing: dry banana, frying, chip



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## Jack Fruit (Artocarpus heterophyllus)



### Green Jackfruit

### Ripe Jack fruit

- Green jack fruit is utilized for making pickle, canned and curried vegetables.
- Ripe fruit is utilized for making canned, frozen and dried products, such as chips, nectar etc.
- The waste (skin, peels and cores) is a good source of pectin.
- Both green and ripe fruit has great potential for minimal processing.
- Jack fruit is known for strengthening Immune System, prevent Cancer, aids in healthy digestion, good for eye and skin and Control Asthma.
- **Cambodia: Green jack fruit used for cooking, Ripe fruit: eating fresh, dry and nectar.**

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## Mango

- The mango is a delightful fruit that is very popular and consumed daily by the Cambodian people.
- Two major production regions: the first in the south (approximately 10,000 ha) focused on the provinces of Kompong Cham north of Phnom Penh and Kompong Speu to the west, and the second in the northwest provinces (approximately 7,000 ha) around Siem Reap, Battambang and Banteay Meanchey province.
- Mango: Mostly eat fresh
- Processing: Mango juice, dry mango, pickle etc.
- Have no any research of nutritional value



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## Tamarind (*Tamarindus indica*)



- Tamarind is found through out most of the tropical regions.
- Worldwide production in over 50 countries. The major production areas are in the Asian countries: India and Thailand, but also in Bangladesh, Sri Lanka, Cambodia, Philippine, Malaysia and Indonesia.
- Tamarind is used for the digestive system and to reduce fevers, inflammation and arthritis pain, lower the cholesterol level and anti-cancer (vitamin C).
- Pulp: rich in potassium, thiamin and tamarind acid, young leave riches in niacin and flower riches in ascorbic acid.
- Cambodia: The tree mostly grows wild, tamarind fruit, mostly use for cooking
- Processing: SMEs use as the raw material for tamarind juice

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## NONI (*Morinda citrifolia*) OF CAMBODIA

Battambang, Kam Pot, Kho Kong and Mondol Kiri of Cambodia, people have taken Noni with food and treated Noni as healing their diseases for long time ago.



The efficiency and quality of the Cambodian Noni is internationally well-known, as the Integrated Framework (IF), being established by WTO trade ministers in 1996 to promote the integration of the least developed countries.

In 2003, a Company called CAPA LTD., started up in Cambodia: NONI of Cambodia (NONI juice)

**Major medical actions:** antibacterial, analgesic, anticongestive, antioxidant, anti-inflammatory etc.  
Prevention of different diseases: cancer, aging, arthritis and hypertension.



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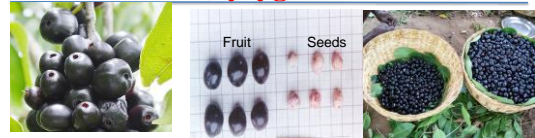
## AONLA (*Phyllanthus emblica*)



- The fruits are highly nutritive and are very rich in vitamin-C and polyphenolics a source of antioxidants
- Its fruits are used for curing chronic dysentery, bronchitis, diabetes, liver ailment, diarrhoea, jaundice, dyspepsia, cough etc.
- Preserve, pickle, candy, jam, syrup and dried shreds can be prepared etc.
- Cambodian cultivation: Wild; no an specific processing (mostly pickle)

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## JAMUN (*Syzygium cuminii*)



- The fruits are very rich in anthocyanin and polyphenolics, a source of antioxidants
- Jamun seeds are used to cure diabetes.
- Jamun is very useful for curing diarrhoea and diabetes.
- It is stomachic carminative and has diuretic and digestive properties.
- Fruit is used for preparation of different fruit products such as beverages, wine, vinegar etc.
- Cambodia: Fruits fresh, it is a seasonal fruit.

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## Research on indigenous fruits in Cambodia

### Very limited in this research area in Cambodia:

- Lack of government support and organizations;
- Lack of the technical knowledge on the **indigenous fruits** research (e.g: extraction methods...)

### Current situation:

- No any specific areas in this research in Cambodia except the academic institution (example ITC) works on the simple components such as vitamins, minerals and fiber:
- The research about nutritive quality of several fruits in Cambodia (Banana, pineapple and mango): project start up with the support from Belgium in 2012)

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## Research on indigenous in Cambodia

### Current situation:

- ITC: Two new projects plan to start up for this year (2013): "Characterization of nutritional value of indigenous vegetables eaten by Cambodian"

"Characterization of nutritional value of different Banana varieties in Cambodia"

- Technical use: HPLC and AAS

### Still wait for the financial support from Belgium

### The other two projects start from march 2013:

- Wine and vinegar production from cashew apple juice
- Wine production from pineapple

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## Challenges

- Research institution/ industries (not indigenous fruits or Fruits).
- No specific national policy on fruit/indigenous fruits .
- Lack of legal framework in this area.
- Need scientific evidence assessment for indigenous fruits .
- Protect consumer from health claim, not misleading, must be truthful.

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## Challenges

- SMEs cannot compete with imported products, cause of poor technology and market demand.
- Use secondary data as market drivers, due to no own research.
- Need joint-research from ASEAN, and others.
- Long term support would be necessary for the start for this area.

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## CONCLUSION

- The indigenous fruit and vegetable are presently underutilized in spite of high nutritive value and medicinal properties but not much in Cambodia.
- Several fruits types in Cambodia (NONI, banana, Jamun, mango etc) can play a great role in satisfying the demand of nutritious and high therapeutic value.
- This fruit was made popular among the consumer in the world over by highlighting the qualities and nutritional properties.
- Highlighting the antioxidant potential, nutritive value and medicinal properties of the processed indigenous fruits of South east Asia as well in Cambodia would go long way in popularizing the fruit.

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**Do hope you enjoy the presentation  
Questions?**



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