

Expert Consultation on the Establishment of A Sago Network for Asia and the Pacific

**21-22 March 2013
Bangkok, Thailand**

Roundtable Report



June 2013

EXECUTIVE SUMMARY

During the period 21-22 March 2013, a roundtable was convened by the Food and Agriculture Organisation of the United Nations (FAO), at the FAO Regional Office for Asia and the Pacific in Bangkok.

The overall goal of the roundtable was to bring together a group of key partners and stakeholders in sago research, development, environmental conservation, and utilization, including researchers, policy makers, private sector entities, CSOs/NGOs, and representatives of concerned development agencies from across Asia and the Pacific Region

This Roundtable included the participation of seventeen individuals representing six countries in the Asia Pacific Region, two representatives from FAO and an international consultant.

The Roundtable commenced with opening remarks by Mr. Hiroyuki Konuma, FAO Assistant Director General and Regional Representative for Asia and the Pacific. The speaker underlined the importance of sago palm in food security and environmental sustainability while generating economic and social benefit to indigenous communities. He also stressed that despite the benefits and potential of sago palm, the crop is not well known and remains underutilized and poorly supported. Mr Konuma also introduced the proposal for the establishment of a Regional Sago Network for Asia and the Pacific (SNAP). The aims of the proposed Regional Network would be to exchange knowledge, share experiences and promote collaboration and concerted efforts on the conservation, sustainable utilization and development of sago palm, and to promote advocacy for its economic, social and environmental values and benefits among all partners and stakeholders who are associated with sago palm and its products.

Following on an FAO presentation on the background to FAO's work on sago palm and the SNAP, a roundtable discussion was convened to identify key issues and gaps in sago development. Major issues were consolidated under a number of different headings of key areas:

1. General facts about Sago Development
2. Sago Starch Market
3. Industrial Supply Chains
4. Small Holder Production and Utilization of Sago Starch
5. Country Views

The draft working document on "Rules and Operational Procedures" for the SNAP were agreed to by all participants. It was agreed that FAO would chair the SNAP unless requested by a two-thirds majority to step down. Two Vice-chairs, each

elected on a bi-annual basis, would support the chair. At least one of the Vice chairs would come from one of the three main sago-producing countries. FAO would host the secretariat of the SNAP for the first four years of the network and would provide technical and operational support required for its establishment and functioning. The hosting institution, on a voluntary basis, would cover operational cost of the Secretariat and Web-site management.

An outline detailing a strategic framework for SNAP was proposed to the participants. It was emphasized that the document was not a blueprint and suggestions were to be solicited on ways to improve the content of various sections of the document. The strategic framework was developed from a concept note and subsequent feedback obtained following circulation to the participants prior to the meeting. The strategic framework was developed around four thematic areas, which were further evolved in a plenary roundtable discussion. Participants were requested to discuss the 4 thematic areas, offer suggestions for changes and provide agreement.

Participants agreed on the strategic framework, including key thematic areas, objectives and outputs. The SNAP is a voluntary partnership of stakeholders promoting research, utilization, conservation and sustainable development of sago palm and its products with an overarching goal of enhancing the contribution of sago palm to food security. The SNAP aims to bring together key partners and stakeholders, including researchers, policy makers, public and private sector entities and representatives of civil society organizations (CSOs) and development partners from across Asia and the Pacific Region, with the following specific objectives, which are to:

- Exchange knowledge, share experience and promote collaboration and concerted efforts among all stakeholders on the research, utilization, conservation and sustainable development of sago palm, and advocate for its economic, social and environmental values and benefits.
- Promote effective linkages among research, utilization, conservation and sustainable development of sago palm and reduce the negative environmental impacts.
- Facilitate the development of policies, strategies, regulatory framework and institutional mechanisms associated with sago palm and its products.

The strategic framework is built around four key thematic areas:

1. Advocacy on sago palm and its utilization
2. Fostering knowledge sharing and networking
3. Fostering innovation
4. Developing appropriate policies and regulatory frameworks

Activities based on each of the four thematic areas and outputs were identified.

Mie University will host the SNAP website for an initial period of 4 years. During this period, the University will provide resources and manpower for web-site development. FAO will support the University by providing oversight to website development.

Participants nominated and unanimously accepted candidates for the two positions of vice-chair:

- a. Prof Bintoro - IPB – Indonesia
- b. Dr. Kopli Bujang - UNIMAS – Malaysia

It was agreed that FAO would host the next meeting of the SNAP in Bangkok in 2014.

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LIST OF ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
CSO	Civil Society Organisation
FAO	Food and Agriculture Organisation of the United Nations
NGO	Non governmental organization
PNG	Papua New Guinea
SNAP	Sago Network for Asia and the Pacific
URL	Uniform Resource Locator

1. Introduction

The developing world is facing serious food security challenges in alleviating widespread chronic hunger and meeting the target of increasing food production by 77 per cent by 2050 to address the demand of its rapidly growing population. This target must be met under various constraints such as the stagnation of expansion of arable lands and increasing scarcity of water resources. The promotion of neglected food crops such as sago palm which has a high starch yield potential and which can grow in underutilized swamps and wetlands with minimal competition from other food crops for land and water use, is therefore of growing importance.

Loss of biodiversity and particularly diversity in food resources with a high level of dependence on major staple foods such as rice, wheat, maize and potatoes, poses yet another global challenge. These four crops account for 60 % of total global caloric intake, and are increasingly targeted by food commodity speculations and price volatility. The value of underutilized indigenous food resources such as sago palm (*Metroxylon* spp.) should, therefore, be fully recognized, and their effective and sustainable utilization promoted to enhance the availability of locally produced food resources in the countries where sago palm is produced.

Sago palm serves as a food security crop which can be harvested over an extended time frame, and as an income earner in many countries where it is grown, thereby contributing to household food security and to poverty alleviation. Starch extracted from the pith of the plant is consumed as a staple food and used in the production of traditional food products. However, the industrial potential of sago starch in the region has been very poorly tapped. Sago palms play an important role in environmental protection toward the conservation of traditional eco-systems and bio-diversity. They also contribute to the preservation of cultural heritage in rural communities.

Despite its environmental and socio-economic benefit, traditional uses and industrial potential, millions of hectares of sago forest in many areas of Asia and the Pacific Region are currently being replaced by oil palm plantations or put to other use. Hence the area under sago palm forests has been declining very rapidly in some countries, and sago palm continues to be an underutilized indigenous food resource in the region. Few countries have invested in improving sago palm productivity and in modernizing the extraction of sago starch or in upgrading the technologies used for adding value to sago starch, in order to sustainably maximize the beneficial contribution of this underutilized crop to the Region's food security.

The multiple benefits and uses of sago palm and its products are not well known to the public, and accordingly sago palm has remained neglected and underutilized. The crop has, in the past, benefitted from minimal policy and budgetary support

from both public and private sectors, and hence there has been almost no policy and strategic approach for long-term planning toward its promotion, sustainable utilization and conservation through research and development, and associated interventions.

Sago palm was one of the key food resources discussed at the “*Regional Symposium on the Promotion of Underutilized Indigenous Food Resources for Food Security and Nutrition in Asia and the Pacific*,” which was co-organized by FAO with Khon Kaen University, JIRCAS and other partners in Khon Kaen, Thailand in 2012. This Regional Symposium agreed on the need for the establishment of a Regional Network for Underutilized Indigenous Food Resources and the development of a Regional Sago Palm Network for Asia and the Pacific as one of the sub-components of this Regional Network.

At the Second ASEAN Sago Symposium convened in Kuching, Malaysia in October 2012, the proposal to establish a Regional Sago Network was supported and was widely endorsed. The aims of the proposed Regional Network would be to exchange knowledge, share experiences and promote collaboration and concerted efforts on the conservation, sustainable utilization and development of sago palm, and to promote advocacy for its economic, social and environmental values and benefits among all partners and stakeholders who are associated with sago palm and its products. It was also envisaged that this regional level sago network would be linked and closely associated with the existing ASEAN Sago Network and International Sago Network, with the inclusion of various sago growing countries including Pacific Island countries.

It is against that background a two-day Roundtable was convened by FAO in Bangkok during the period 21-22 March 2013. The overall goal was to bring together a group of key partners and stakeholders in sago research, development, environmental conservation, and utilization, including researchers, policy makers, private sector entities, CSOs/NGOs, and representatives of concerned development agencies - from across Asia and the Pacific Region.

Inputs to the Roundtable

Inputs to the roundtable were introductory PowerPoint presentations, working draft documents for the “Rules and Operational Procedures for the SNAP,” the Strategic Framework and work plan worksheets.

A number of plenary roundtable discussions were organized to:

- a. Provide a forum for the participants to share experiences in sago development, identify gaps and highlight key issues.
- b. Seek agreement on the final draft rules and operational procedures for the SNAP.

- c. Provide a forum for the participants to discuss the 4 thematic areas proposed in the strategic framework, offer suggestions for changes and provide agreement on the four thematic areas.

Prior to each roundtable discussion, background material was presented detailing the concepts and ideas to be explored during the discussion.

A breakout session was organized to identify the outcomes and outputs for each of the four thematic areas. A total of four working groups were established and each group tasked to identify possible outputs for a single thematic area. Participants were free to join the group of their choice. During a plenary session the proposed outputs were discussed, amended and approved by the participants.

2. Synthesis of Sago Background Papers

The sago palm predominates in countries such as Thailand (South Thailand), Malaysia (Sabah, Sarawak and West Malaysia), Indonesia (Papua, Maluku, Sulawesi, Riau Island, and Mentawai Island), the Philippines (Visayas and Mindanao), Timor Leste, Micronesia (Solomons and Vanuatu), Fiji, and Samoa and is found largely between 17°S and 15 – 16°N latitude. Indonesia, Malaysia and Papua New Guinea are the three leading producers of sago palm globally, and produce the crop on a commercial basis.

The sago palm is extremely hardy and is one of the few tropical crops that can tolerate wet growing conditions, including growth in peat swamps which are unsuitable for most agricultural production. It is immune to floods, drought, fire and strong winds. Its large fibrous root system traps silt loads and removes pollutants, faecal contaminants and heavy metals from the environment where it is grown. Given its relative tolerance to salinity, the sago palm offers protection to low-lying coastal areas from extensive saltwater flooding by storm surges. Sago forests serve as an excellent carbon sink for carbon sequestration, thereby mitigating the greenhouse effect and global warming arising from the release of carbon dioxide into the atmosphere. Sago palms, therefore, play an important role in environmental protection toward the conservation of traditional eco-systems and bio-diversity. They also contribute to the preservation of cultural heritage in rural communities.

Sago palm serves as a food security crop which can be harvested over an extended time frame, and as an income earner in many countries where it is grown, thereby contributing to household food security and to poverty alleviation. The leaves and stems of the palm serve multiple functional purposes – for housing, as roofing material, etc. The pith of the sago palm is often utilized as animal feed. Starch

extracted from the pith of the plant is consumed as a staple food and is traditionally used in the production of cookies, sweets and breads or noodles for local consumption in many sago growing countries, while some of it is exported for commercial use. Sago worms are often cultured by farmers for use as food, and provide a good source of income generation especially for women. The industrial potential of sago starch in the region has, however, been very poorly tapped.

When grown in a suitable environment with organized farming practices, the sago palm could have a yield potential of 10-15 metric tons of dried starch per hectare per year. This starch yield per hectare is approximately 3 to 4 times higher than that of rice or wheat.

Sago palm has many benefits and provides strong economic, cultural and environmental advantages in the areas where it is grown. Some of the key benefits of sago palm include the fact that it:

- Serves as food reserve to meet emergency food needs;
- Promotes farm household income and employment through the production of confectionery and cookies, roofing material from leaves, the production of woven mats and handicrafts, as well as sago worms, etc.;
- Is a symbol for the conservation of traditional community linkages and cultural heritage;
- Contributes to slowing the pace of global warming through its year-round carbon dioxide absorbing function;
- Conserves fresh water swamps, thereby creating natural water reservoirs that provide a clean water source all year round to villagers; and
- Helps in the preservation of bio-diversity (plant, aquatic animals, etc.).

Sago starch extracted from the sago palm, offers considerable potential as a raw material for processing at the cottage, small, medium and large scale, into a diversified range of products, as well as for the low cost production of ethanol (including the use of residues and waste) without land competition with other food crops.

Despite sago's environmental and socio-economic benefit, traditional uses and industrial potential, few countries have invested in improving sago palm productivity, modernizing the extraction of sago starch or in upgrading the technologies used for adding value to sago starch. The multiple benefits and uses of sago palm and its products are not well known to the public, and accordingly sago palm continues to remain neglected and underutilized. The crop has received relatively little policy attention and budgetary support from either public or private

sectors, and hence there has been almost no policy and strategic approach for long-term planning towards its promotion, sustainable utilization and conservation through research and development, and associated interventions.

There has been limited progress with sago palm development and commercialization over the past 30 years. Specifically:

- The sago palm and its potential are not widely known and / or appreciated;
- Few countries have invested in modernizing extraction of sago starch or in upgrading the technologies used for extracting sago starch and adding value to it;
- Relatively limited networking among researchers, development agencies and government, and non-government organizations engaged in sago palm research and development;
- Lack of a strategic vision and orientation designed to guide sago palm development in the region for sustainable development of the crop; and
- Lack of policies, strategies and regulatory frameworks to guide and support sago palm development.

3. Issues and Gaps in Sago Palm Development

During working group deliberations, participants were requested to share experiences on Sago development, identify gaps and highlight key issues.

The outputs of that roundtable discussion (Annex 3) are presented under a number of key areas and issues:

Key Area 1: General Facts About Sago Palm Development - Under key area 1, participants recognized the following major issues that were deliberated on:

- Categories of sago producers and sago enterprises
- Role of government

Key Area 2: Sago Starch Market - Under key area 2, participants recognized the following major issue that was deliberated on:

- Sago starch market - current situation

Key Area 3: Industrial Supply Chains – Under key area 3, participants recognized the following major issues that were deliberated on:

- Production
- Industrial Processing

- Sago flour and sago starch as major processing outputs
- Limitations of processing operations
- Dry processing as an option
- Starch Quality
 - Polyphenolics as an impediment
 - Beneficial impacts of polyphenolics
- Waste reduction strategies

Key Area 4: Small Holder Production and Utilization of Sago Starch – Under key area 4, participants recognized the following major issues that were deliberated on:

- Social dimension
- Contribution of sago towards food security
- Market opportunity for sago products produced by small-scale businesses

Key Area 5: Country Perspectives – Under key area 5, participants recognized the following major issues that were deliberated on:

- Japan – example of a user
- Malaysia – example of a producer
- Thailand – example of small producer and rural based user of sago
- Papua – example of producer

4. Rules And Operational Procedures For The SNAP

Participants agreed on a draft “Rules and Operational Procedures” for the SNAP. The final version of the “Rules and Operational Procedures” agreed to by all participants is attached as Annex 4.

General Considerations

Participants agreed with the proposed name of the Network, which will be “Regional Sago Network for Asia and the Pacific” (SNAP) and adopted the proposed structure for the network.

Specific Considerations

Within this agenda item participants agreed that FAO would chair the SNAP for the first four years, unless requested by a two-thirds majority to step down. It was also agreed that there would be two Vice-chairs, each to be elected. At least one of the Vice chairs would come from one of the three main sago-producing countries – Indonesia, Malaysia and PNG. One of the vice-chairs must be a representative of an Institution. The Vice-chairs would be elected on a bi-annual basis. Vice chairs could stand for election to the Chair after two years. Terms of Reference of the Chair and Vice-chair were discussed and agreed to.

Participants agreed that FAO would host the secretariat of the SNAP for the initial stage of the network and provide technical and operational support required for its establishment and functioning, as outlined in the terms of reference attached to the “Rules and Operational Procedures” for the SNAP (Annex 4).

Participants agreed that the hosting institution on a voluntary basis would cover operational cost of the Secretariat and Web-site management. The SNAP will, however, accept sponsorship and financial contributions and donations for joint activities as appropriate, from other member institutions.

5. Strategic Framework

Participants agreed on a strategic framework, including key thematic areas, objectives and outputs. The final version of the strategic framework agreed to by all participants is attached as Annex 5.

Strategic Priorities

The SNAP is a voluntary partnership of stakeholders promoting research, utilization, conservation and sustainable development of sago palm and its products with an overarching goal of enhancing the contribution of sago palm to food security. The SNAP aims to bring together key partners and stakeholders, including researchers, policy makers, public and private sector entities and representatives of civil society organizations (CSOs) and development partners from across Asia and the Pacific Region, with the following specific objectives, which are to:

- Exchange knowledge, share experience and promote collaboration and concerted efforts among all stakeholders on the research, utilization, conservation and sustainable development of sago palm, and advocate for its economic, social and environmental values and benefits.

- Promote effective linkages among research, utilization, conservation and sustainable development of sago palm and reduce the negative environmental impacts.
- Facilitate the development of policies, strategies, regulatory framework and institutional mechanisms associated with sago palm and its products.

The strategic framework is built around four key thematic areas:

5. Advocacy on sago palm and its utilization
6. Fostering knowledge sharing and networking
7. Fostering innovation
8. Developing appropriate policies and regulatory frameworks

Thematic area 1: Advocacy on sago palm and its utilization

Advocacy is required to promote awareness about the sago palm and its products. Advocacy encompasses many activities including media campaigns, the production of promotional materials, the organization of promotional events, etc.

Objectives would include:

1. To promote awareness about the sago palm and the value of its products.

In attaining this objective, the following outputs were identified:

- a. Public forums and campaigns to enhance awareness of sago and its products.
- b. Local curricula on sago production and its utilization for local schools.
- c. Sago learning centres established in sago producing countries.
- d. Sago Day / Sago Year involving participation of core farmers / producers observed in each country.

2. To advocate for promotion of sago palm research, utilization, conservation and sustainable development.

In attaining this objective, the following outputs were identified:

- a. An integrated and comprehensive research strategy and action plan on sago covering upstream and downstream research activities and social studies.
- b. Good management practices, success stories and models for conservation and sustainable development identified and available to stakeholders and the general public in sago producing countries.
- c. Strategies to improve cooperation among smallholders, plantation owners / managers and industry formulated and implemented.
- d. Advocacy campaign package (brochures, video material, pamphlets, etc) available to stakeholders and the general public in sago producing countries and beyond.

Thematic area 2: Fostering knowledge sharing and networking

Relatively limited networking exists among researchers, development agencies and government, and non-government organizations engaged in sago palm research and development across Asia and the Pacific region. Many countries lack a strategic vision and orientation designed to guide sago palm conservation and development for sustainable development of the crop. Coordination within the SNAP will, therefore, encourage the formation of working groups or consortia of institutions in the different thematic areas under the network as well as facilitating the exchange of information among these areas.

Objectives would include:

1. To establish and facilitate a sago palm virtual forum for communication and knowledge sharing.

In attaining this objective, the following outputs were identified:

- a. SNAP website established and linked with existing sago related web sites.
- b. Active social networking among stakeholders via Facebook, LinkedIn., etc.
- c. Database of literature on sago created and accessible through the SNAP website.
- d. SNAP mailing / email list created and available.
- e. Video / audio conference focal point in each member country identified and available to members.
- f. Sago email newsletter produced and distributed every 6 months.

2. To effectively promote sago networking among stakeholders.

In attaining this objective, the following outputs were identified:

- a. Conferences / symposia on sago palm organized and implemented.
- b. Exchange programs for knowledge and experience sharing established among institutions.
- c. Regional Sago Internship Program established including internship to academic and development institutions and industry (processing and production sectors).

Thematic area 3: Fostering innovation

There is a need to foster innovation in sago development as the outputs of research through innovation (knowledge, methodologies, technologies, new organizational models, etc) are used by stakeholders involved in the development and utilization of

the sago palm. Human resource capacity development is a critical prerequisite toward fostering innovation to deliver sustainable impact.

Objectives would include:

1. To promote effective utilization of sago for food products.

In attaining this objective, the following outputs were identified:

- a. Improved nutritional value (including fortification) of sago flour / starch and sago products.
- b. Extended range of food products (pasta, bread, chips, cookies, etc.) derived from sago flour / starch.
- c. New, environmentally friendly processing techniques and product formulations for using sago flour / starch, in producing products of comparably higher nutritional value.
- d. Novel methods / recipes for preparation of sago flour / starch dishes and products at the household and community level.
- e. Simple, low cost and appropriate technologies for micro and small- scale processing of sago starch / flour.

2. To promote utilization of sago for non-food products.

In attaining this objective, the following outputs were identified:

- a. New / improved methods for value addition to sago starch / flour through production of commercially viable non-food products (ethanol, lactic acid, etc).
- b. Guidelines for the non-food use of sago starch of different qualities and grades, developed for future standardization across sago producing countries.
- c. Options for direct utilization of sago pith without the need for conventional starch extraction.

3. To promote conservation of sago palm and the environment.

In attaining this objective, the following outputs were identified:

- a. Inventory of existing sago forests and natural stands.
- b. Strategy and action plan for sago palm conservation.
- c. Good Management Practice identified and introduced to sago stakeholders (including sago mills) for water management and to minimize environmental impact.

4. To promote the utilisation and management of sago waste.

In attaining this objective, the following outputs were identified:

- a. Improved waste management practices identified and promoted by all sago stakeholders, including new and existing sago mills.
 - b. Value added products from the sago palm, including from its waste and its by-products, identified and promoted.
5. To enhance cultivation, production and harvesting of sago palm.

In attaining this objective, the following outputs were identified:

- a. Plantation managers and sago farmers trained in improved and appropriate farm management practices.
- b. Increased productivity per land area of sago farms through varietal improvement and other technological innovations.
- c. Enhanced knowledge and skills of sago plantation owners and small holders in improved agronomic practices.

Thematic area 4: Developing appropriate policies and regulatory frameworks

Policies and regulatory frameworks that are applicable to the industrial scale development of the sago palm would not be adequate for micro- and small-scale enterprises that involve the rural poor. A range of different policy options must, therefore, be considered to address the different levels of sago palm development across countries. Harmonisation of policies and the development of regulatory frameworks at the local, national, sub-regional and regional level is an important element of this strategy.

Objectives would include:

- 1. To facilitate governments in formulating policies and in providing an enabling environment for smallholders and plantation development.

In attaining this objective, the following outputs were identified:

- a. Appropriate policies and guidelines to develop sago industries.
- b. Appropriate industrial standards for sago starch / flour.
- c. Appropriate policies and guidelines to safeguard existing natural sago stands /forest.
- d. Appropriate policies and guidelines to support smallholder farms and plantations.
- e. Household cultivation of sago promoted through strong government support.
- f. Social contribution for sago palm conservation promoted.
- g. Appropriate policies and guidelines to support sago products marketing and value chain development.

6. SNAP Administration

Web-site Management

Mie University offered to host a website on sago palm for an initial period of 4 years. During this time the University will provide resources and manpower. FAO will support the University by providing oversight to the website development. The website's URL, when hosted at Mie University, will be an extensions of Mie University's URL.

It was agreed that cost of establishing an independent website (www.SNAP...) would be investigated. Pending the amount, FAO may be in a position to provide support. Prof Ehara would consult with FAO-IT on this matter.

Participants discussed the feasibility of charging membership fees to support running costs of the web-site. Charging of fees was found not to be feasible, but *Adhoc* donations may be appropriate.

Selection of Vice Chair

Participants were requested to nominate candidates for the two positions of vice-chair. Two names were proposed:

- c. Prof Bintoro – Bogor Agricultural University – Indonesia
- d. Dr. Kopli Bujang – University Malaysia Sarawak – Malaysia

The nominations were unanimously accepted by the participants.

Date for the Next Meeting

It was agreed that FAO would host the next meeting of the SNAP in Bangkok in 2014.

7. Workplan proposals

Participants were requested to propose activities based on the four thematic areas and outputs identified during discussions on the Strategic framework, and to submit them by email for consolidation. The resulting consolidated work plan is included in Annex 6.

Annex 1

Roundtable Agenda

PROVISIONAL AGENDA

Expert Consultation on the Establishment of A Sago Network for Asia and the Pacific

21-22 March 2013

Purpose: *This expert consultation brings together key country stakeholders and experts working on Sago Palm to discuss the modalities for developing a Sago Network for Asia and the Pacific*

	Day 1
08:30 – 09:00	Registration
09:00 – 09:20	Introduction of moderators and participants
09:20 – 09:50	Opening Remarks Mr. Hiroyuki Konuma Assistant Director-General and Regional Representative FAO Regional Office for Asia and the Pacific
09:50 - 10:10	Background to the Sago Network – R. Rolle, Senior Agro-Industry and Post-harvest Officer, FAO-RAP
10:10 – 10:30	Why we are here and what we expect to accomplish - C. Oates, FAO Expert Facilitator
10:30 – 10:45	Coffee Break
10:45 – 12:00	Roundtable discussion on key issues and gaps in sago development
12:00 – 13:00	Lunch
13:00 – 14:30	Discussion of the draft document on Rules and Operational

	Procedures
14:30 – 15:00	Coffee Break
15:00 – 16:00	Draft Strategic Framework – Thematic Areas - R. Rolle, Senior Agro-Industry and Post-harvest Officer, FAO
16:00 – 16:30	Brief wrap-up Day 1
18:00 – 20:00	Cocktail Reception

	Day 2
08:30 – 09:00	Recap of day 1 – C. Oates, FAO Facilitator
09:00 – 11:00	Break-out session: Discussion on Strategic Thematic Areas and identification of priority outputs
09:30 – 10:00	Coffee Break
11:00 – 12:00	Plenary presentation: Part 1
12:00 – 13:00	Lunch
12:00 – 13:00	Plenary presentation: Part 2
14:00 – 14:30	Coffee Break
14:30 – 15:30	Break-out session – Work planning for 2013 under thematic areas
15h30 – 16:00	Round-table discussion – Elaboration/finalization of 2013 work plan
16:00 – 16:30	Wrap-up and Closing

Annex 2

Opening Remarks

Expert Consultation on the Development of a Regional Sago Network for Asia and the Pacific

OPENING REMARKS

by

Hiroyuki Konuma

Assistant Director-General and
FAO Regional Representative for Asia and the Pacific
Bangkok, Thailand

Good morning everyone,

Firstly, I wish to welcome you all to Thailand, and to FAO's Regional Office for Asia and the Pacific, or FAO-RAP. I wish to express my sincere gratitude and appreciation to you all, for taking time off your busy schedules to participate in this important Expert Consultation on the development of a Regional Sago Network for Asia and the Pacific or SNAP.

As you may know, FAO is an United Nations socialized technical agency responsible for agriculture, food security and rural development. It aims to attain a world free from hunger and malnutrition, where food and agriculture contribute to improving the living standards of all, especially the poor, in an economically, socially and environmentally sustainable manner. FAO is, therefore very pleased to host this first Expert Consultation on the development of the SNAP.

Ladies and Gentlemen,

The developing world is facing serious food security challenges in alleviating widespread chronic hunger and meeting the target of increasing food production by 77 % by 2050 to address the demand of its rapidly growing population. This target must be met under various constraints such as the stagnation of expansion of arable lands and increasing scarcity of water resources. The promotion of neglected food crops such as sago palm which has a high starch yield potential and which can grow in underutilized swamps and wetlands with minimal competition from other food crops for land and water use, is therefore of growing importance.

Loss of biodiversity and particularly diversity in food resources with a high level of dependence on major staple foods such as rice, wheat, maize and potatoes, currently poses a global challenge. These four crops account for 60 % of total global caloric intake, and are increasingly targeted by food commodity speculations and price volatility. The value of underutilized indigenous food resources such as sago palm (*Metroxylon* spp.) should, therefore, be fully recognized, and their effective and sustainable utilization

promoted to enhance the availability of locally produced food resources and reduce dependence on imported food starches in the countries where sago palm is produced.

When grown in a suitable environment with organized farming practices, the sago palm could have a yield potential of 10-15 metric tons of dried starch per hectare per year. This starch yield per hectare is approximately 3 to 4 times higher than that of rice or wheat.

The sago palm provides strong economic, cultural and environmental advantages in the areas where it is grown. The sago palm:

- Can grow in swamps and wet land which are not suitable for agricultural production;
- Is tolerant to drought and floods; and,
- Has a high starch yield potential (under organized plantation, the starch yield per hectare is approximately 3 to 4 times higher than that of rice or wheat), which can be produced at a low cost when compared with other crops.

The sago palm also

- Serves as food reserve to meet emergency food needs; and,
- Promotes farm household income and employment through the production of confectionery and cookies, roofing material from leaves, the production of woven mats and handicrafts, as well as sago worms, etc.

In addition, it serves as

- A symbol for the conservation of traditional community linkages and cultural heritage;
- Contributes to slowing the pace of global warming through its year-round carbon dioxide absorbing function;
- Conserves fresh water swamps, thereby creating natural water reservoirs that provide a clean water source all year round to villagers;
- Helps in the preservation of bio-diversity (plant, aquatic animals, etc.)

Sago starch extracted from the sago palm, offers considerable potential as a raw material for processing at the cottage, small, medium and large scale, into a diversified range of products, as well as for the low cost production of ethanol (including the use of residues and waste) without land competition with other food crops. Ethanol production from sago starch, in fact, minimizes the risk of food insecurity which might be caused by the promotion of ethanol production from other food crops such as cassava.

Despite its environmental and socio-economic benefit, traditional uses and industrial potential, few countries have invested in improving sago palm productivity and in modernizing the extraction of sago starch or in upgrading the technologies used for adding value to sago starch, in order to sustainably maximise the beneficial contribution of this underutilized crop to the Region's food security.

The multiple benefits and uses of sago palm and its products are not well known to the public, and accordingly sago palm continues to remain neglected and underutilized. The crop has received relatively little policy attention and budgetary support from both public and private sectors, and hence there has been almost no policy and strategic approach

for long-term planning towards its promotion, sustainable utilization and conservation through research and development, and associated interventions.

FAO has a long history of 40 + years working on the sago palm. FAO's work on sago palm development was initiated in the 1970's. The level of attention paid to sago palm development, however, declined during the decade 2000 - 2010. The recent past (refer to the slide), has however, witnessed a resurgence of interest in the sago palm, and your positive feedback and interest has brought us here today to formalise the development of the SNAP.

The SNAP will be a voluntary partnership of stakeholders – including researchers, policy makers, public and private sector entities and representatives of civil society organizations and development partners from across this region. Its overarching goal will be to enhance the contribution of the sago palm to food security.

One key output of this Expert consultation will be a strategic framework built around four key thematic areas:

- Advocacy on sago palm and its utilization;
- Fostering knowledge sharing and networking,
- Fostering innovation; and,
- Developing appropriate policies, strategies and regulatory frameworks.

We have formulated these thematic areas on the basis of the feedback that you have provided to us on the concept note, and will be seeking your further inputs to the design of this framework.

Ladies and Gentlemen,

We have quite a lot to cover, over the next two days, in order to get the SNAP up and operational. I will, therefore end here, by wishing you all, fruitful deliberations, and look forward to the outcomes of the deliberations of this Expert Consultation.

Thank you.

http://www.fao.org/asiapacific/rap/home/about-assistant-director-gen/speeches/detail/en/?no_cache=1&speech_id=347

Annex 3

Sago Palm Gaps and Issues

SAGO PALM GAPS AND ISSUES

Key Area 1: General Facts About Sago Palm Development

The Consultation recognized the following major issues that were deliberated on:

- Background to sago development
- Role of government

Key Issues	Gaps
1. Categories of sago producers and sago enterprises	
• Two levels of enterprise recognized: a. Small-scale - Small holder, household and micro-scale enterprises b. Large scale- plantation, processing and utilization • In general: a. Food products are produced by large-scale, SME and household enterprises b. Non-food products are produced mainly by large-scale enterprises • Small scale / household level production can contribute towards poverty alleviation and rural development	• Lack of methods, approaches and technology for limiting environment impact and environmental conservation
2. Role of Government	
• Government action and policy interventions are very important. For example: a. Indonesia – government distribution of sago starch to poor people, benefitting growers and poor. b. Sarawak – Grower schemes and large plantations developed. Successful programme.	• Lack of a common platform to drive sago development in the future

Key Area 2: Sago Starch Market

The Consultation recognized the following major issue that was deliberated on:

- Sago starch market - current situation

Key Issues	Gaps
1. Sago starch market - current situation	
• There are a number of market issues that positively and negatively impact on the potential for sago • Two key markets are available for sago starch, (i) low volume-high price; and (ii) high volume-low price • Low volume-high price a. For some product segments, sago starch is considered to be a high value starch – better than wheat, cassava and potato b. Sago starch has a number of dietary benefits such as low glycemic index and its potential of assisting weight loss c. In these markets sago starch prices are high compared to potato starch. d. In these markets there is lower price sensitivity, but quality is a major issue • High volume-low price a. Strong market interest / demand for industrial grade starch for fermentation b. In these markets there is strong price sensitivity and increasing prices of sago starch, has led to sourcing of alternate starches by buyers • High and low value starch products can co-exist, but need to be clearly delineated • Balance between increasing production output and price • Sago starch prices stable on international markets a. Malaysia - 1,800 Ringit ex-factory b. Indonesia – 700 USD/tonne	• Low value and high value starch markets are not yet fully developed • There is no clear strategy to lower the cost of sago starch in order to make it more attractive in low cost markets • Buyers and processors are not knowledgeable on the value of high quality sago starch • Lack of marketing strategy that promotes sago as a multi-purpose starch • Lack of marketing strategy that promotes sago in niche high-end markets • Lack of marketing strategy that promote dietary benefits of sago • Need to defining an appropriate marketing strategy to increase the opportunity for sago (one proposal is to consider placing emphasis on non-food markets)

Key Area 3: Industrial Supply Chains

The Consultation recognized the following major issues that were deliberated on:

- Production
- Industrial Processing
 - Sago flour and sago starch as major processing outputs
 - Limitations of processing operations
 - Dry processing as an option
- Starch Quality
 - Polyphenolics as an impediment
 - Beneficial impacts of polyphenolics
- Waste Reduction Strategies

Key Issues	Gaps
1. Production	
• Mass cultivation is limited to only two countries in the region, namely Indonesia and Malaysia • Small holder cultivation predominant in the other countries • There are advantages to mass cultivation (plantations), such as: • Easier access to the sago palms • Plantations are easier to manage compared with smaller land plots • Plantations have less problems with pest infestation • There are negative social issues with respect to mass cultivation relating to land ownership, fair practices, etc • Improved social dimensions related to smallholder production • Level of phenolic content of sago palm is linked with varietal differences	• Lack of efficient means to access the sago palms and methods to bring out the material, limits smallholder participation • High starch yielding varieties have not been identified
2. Industrial processing	
2a. Sago flour and sago starch as major processing outputs	
• Two sago extraction products recognized: ▪ Sago Flour – Less rigorous extraction resulting in products in-which nutrients and fiber are retained -	• Lack of harmonized definition and use of the terms sago flour and sago starch across the region

Existing Codex Standard for sago flour ▪ Sago Starch - Is a more refined product than sago flour with lower fiber and micronutrient content • Sago Starch has a number of unique properties which positively impact its marketability, namely: ▪ Viscosity ▪ Nature of the starch granule ▪ Produces clear/transparent gels – suitable for glass noodle production • Properties of sago starch are similar to potato starch • The economics of sago processing can be improved through by-product utilization	
2b. Limitations to sago processing	
• It is recognized that several factors limit efficiency and cost effectiveness of sago starch production • Key constraints to starch extraction are inadequate availability of raw material and poor processing efficiencies • The value of sago can be increased by utilizing all components of the palm and processing by-products	• The factors and their relative impact on efficiency and cost effectiveness of sago starch production are not fully identified / understood Inadequate investment in technology to maximize starch recovery
2c. Dry processing as an option	
• Dry processing is a promising method for improving starch extraction efficiency and reducing waste, because: ▪ There is a theoretical 90 % starch recovery ▪ No fear of contaminated water for processing ▪ No problem with effluents ▪ No environmental problems	• Dry processing as a viable commercial technology is still not proven on an industrial scale
3. Starch quality	
3a. Polyphenolics as an impediment	
• Residual polyphenolic content of sago starch is problematic for industrial processing, mainly because they are a	• No harmonized or recognized standard for whiteness of sago starch

cause of browning and whiteness is a market requirement for sago starch Factories undertake bleaching of the starch to improve its acceptability by the market	
3b. Beneficial impact of polyphenols	
- The beneficial impact of polyphenolics could be leveraged thereby making brown starches / flours considered to be better than white - Such products will benefit from the growing demand for functional foods and specifically foods with antioxidants - Potential market exists for flour containing polyphenols	
4. Waste reduction strategies during pith processing	
- A major strategy for lowering the cost of sago starch production is to improve waste reduction through increased utilization of waste by-products from pith processing - By-product can be used to increase revenue, for example: - Sago starch residues can be used for alcohol production - Sago bark residues can pelletized and used for energy production, such as electricity generation. 10 tons bark can produce 1200 kw electricity, providing a potential energy source for powering factories - Hampas can be used as a: (1) Biocompost and Biopesticides; (2) Seedling medium; (3) Worm production; (4) Mushroom production; or (5) Dewatering, pelletizing for animal feed	- Lack of information on production cost/benefit for by-product value addition - The most suitable by-product and the specific markets for these products are not yet identified, this limits the economic value which can be realized by these by-products - There is a gap between research and commercial realities. Identifying research topics and bringing research results to market should be handled with care as good research results do not always translate into real commercial benefits in all / some countries (high cost of inputs such as enzymes in some markets for value addition to by-products)

Key Area 4: Small Holder Production and Utilization of Sago Starch

The Consultation recognized the following major issues that were deliberated on:

- Strong social dimension
- Contribution of sago towards food security
- Market opportunity for sago products produced by small-scale businesses

Key Issues	Gaps
1. Social dimensions	
• Sago palm has a special meaning in preserving community culture, and heritage • Source of income and employment generation for small-holders	• Need to include small holders in all activities of the sago chain
2. Contribution of sago to food security	
• Sago is a good source of calories and energy, but is low in protein and micronutrients • Sago products should target those who lack sufficient energy intake • Potential for sago starch/flour fortification in order to enhance micronutrient quality • Dry processing could enhance nutrient retention during processing, thereby improving the nutritional content of sago flour • Sago flour should be consumed with protein rich foods for a balanced diet. For example in Papua – sago is consumed with other protein-rich foods (including sago worms) to enhance protein content in diets	• Lack of technological innovation for micronutrient fortification of sago flour • Lack of nutrition education to balance diets in rural communities
3. Market opportunity for sago products produced by small scale businesses	
• National / local market opportunity exists for sago based food / meals	• Lack of market expansion strategies for sago products produced by small-scale businesses • Lack of approaches and strategies to involve other industries or small-scale operations in developing sago products • Lack of education, recipes and products ideas for home preparation of sago products, such as cookie

Key Area 5: Country Perspectives

The Consultation recognized the following major issues that were deliberated on:

- Japan – example of a user
- Malaysia – example of a producer
- Thailand – example of small producer and rural based user of sago
- Papua – example of producer

Key Issues	Gaps
1. Japan – example of a user	
• Main starch sources consumed in Japan are sweet potato, potato, corn, and cassava • Sago Starch is a minor starch source • Sago starch is used in noodle production • Sago starch is difficult to use for chemical applications (Sticky nature and difficult to use for processing)	
Malaysia – example of a producer	
• Some by-products of sago production are high value, such as sago worm • 1 kg worms – 10-15 US – produced on waste • Malaysia is considering the relative benefits of the dry vs wet extraction process • Sago starch extraction effluents can be used by the fish farming industry as a source of fish food • Sago starch effluent, which contains about 4 % fiber can be used for SCP and Spirulina production. Clean water results • Malaysia is considering biodiesel production from sago • High cost of sago starch limits the commercial viability of sago for industrial processes, currently only a 20 - 25 % success rate	

Thailand – example of small producer and rural based user of sago	
• Leaves are the main source of income • Trunk is used for worms and starch • Simple centrifugation technology developed to enhance starch recovery for small-scale producers • Mobile facilities for pith production in the field to reduce transport cost have been developed	
Papua – example of producer	
• High level of variability in starch yields • Relatively limited harvesting of sago trunks • Government supports and promotes plantation development • Starch is expensive in Papua New Guinea • Used as ceremonial food causing price increase • Vision to develop sago with small-holder participation in export markets (Papua)	

Annex 5

Rules and Operational Procedures for SNAP

Regional Sago Network for Asia and the Pacific

Rules and Operational Procedures



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A. BACKGROUND

The developing world is facing serious food security challenges in alleviating widespread chronic hunger and meeting the target of increasing food production by 77 per cent by 2050 to address the demand of its rapidly growing population. This target must be met under various constraints such as the stagnation of expansion of arable lands and increasing scarcity of water resources. The promotion of neglected food crops such as sago palm which has a high starch yield potential and which can grow in underutilized swamps and wetlands with minimal competition from other food crops for land and water use, is therefore, of growing importance.

Sago palms play an important role in environmental protection toward the conservation of traditional ecosystems and bio-diversity. They also contribute to the preservation of cultural heritage in rural communities. When grown in a suitable environment with organized farming practices, the sago palm could have a yield potential of 10-15 metric tons of dried starch per hectare per year. This starch yield per hectare is approximately 3 to 4 times higher than that of rice or wheat.

Sago palm serves as a food security crop which can be harvested over an extended time frame, and as an income earner in many countries where it is grown, thereby contributing to household food security and to poverty alleviation. Despite its environmental and socio-economic benefit, traditional uses and industrial potential, thousands of hectares of sago forest in many countries in Asia and the Pacific Region are currently being replaced by oil palm plantations or put to other use.

The multiple benefits and uses of sago palm and its products are not well known, and accordingly sago palm has remained neglected and underutilized. The crop has, in the past, benefitted from minimal policy and budgetary support from both public and private sectors, and hence there has been almost no policy and strategic approach for long-term planning towards its promotion, sustainable cultivation, utilization and conservation through research, development, and associated interventions.

The aims of the Regional Network are to exchange knowledge, share experiences and promote collaboration and concerted efforts on the conservation, sustainable cultivation, utilization and development of sago palm, and to promote advocacy for its economic, social and environmental values and benefits among all partners and stakeholders who are associated with sago palm and its products. It is also envisaged that this regional level sago network would be linked and closely associated with existing networks. Within this context and against this background, the Regional Sago Network for Asia and the Pacific is being formed.

B. STRUCTURE

1. Name

The name of the Network will be Regional Sago Network for Asia and the Pacific (SNAP), hereinafter referred to as the SNAP.

2. Establishment

The SNAP will be established at the Expert Consultation on the Development of a Regional Sago Network for Asia and the Pacific convened by FAO, on 21 and 22 March, 2013, at the FAO Regional Office for Asia and the Pacific in Bangkok, Thailand.

3. Goal and objectives

The SNAP will be a voluntary partnership of stakeholders promoting research, utilization, conservation and sustainable development of sago palm and its products with an overarching goal of enhancing the contribution of sago palm to food security and economic development. The SNAP aims to bring together key partners and stakeholders, including researchers, policy makers, public and private sector entities and representatives of civil society organizations (CSOs), and development partners from across Asia and the Pacific Region, with the following specific objectives:

- To exchange knowledge, share experience and promote collaboration and concerted efforts among all stakeholders on the research, cultivation, utilization, conservation and sustainable development of sago palm, and advocate for its economic, social and environmental values and benefits;
- To promote effective linkages among public and private stakeholders associated with sago palm and reduce the negative environmental impacts of its by-products.
- To facilitate the development and implementation of policies, strategies and institutional mechanisms associated with sago palm and its products and by-products.
- To promote the consumption and utilization of sago.

4. Membership

The SNAP will have a neutral identity. It will operate in an open, transparent and flexible manner. It will be linked and closely associated with existing networks.

The inaugural members of the SNAP will include:

Academic and Research Institutions

- Bogor Agricultural University, Indonesia
- Center of Excellence for Sago Research, Universiti Malaysia, Sarawak

Malaysia

- Craun Research Sdn. Bhd., Malaysia
- Food and Agriculture Organization of the United Nations (FAO)
- Food and Nutrition Research Institute, Philippines
- Japan International Research Center for Agricultural Sciences (JIRCAS)
- Kasetsart University, Thailand
- Kyushu University, Japan
- Mie University, Japan
- Rajamangala University of Technology Srivijaya, Thailand
- Rikkyo University, Japan
- Tokyo University of Agriculture and Technology
- Tsukuba University, Japan
- University of the Philippines
- University of Papua, Manokwari, Indonesia
- University of the South Pacific
- University of Technology, Papua New Guinea,

Civil Society Organizations

- Nature Fiji, Fiji
- Yadfon Foundation, Thailand

Senior Experts Participating in an Individual Capacity

- Dr. Jong Foh Shoon, Malaysia
- Dr. Shigeru Kushima (Hisajima)
- Dr. Christopher Oates

5. SNAP Activities

The SNAP will interact with a wide range of partners and stakeholders working on various aspects of sago palm research, cultivation, utilization and conservation. It will, in the process, provide an informal mechanism for cooperation and collaboration among international and regional organizations, research and academic institutions, CSOs, public and private-sector entities and other associated groups.

Activities include the following:

- **Knowledge sharing** - research results, meeting reports, project outputs/outcomes - on the research, cultivation, utilization and conservation of the sago palm in Asia and the Pacific Region;
- **Identification of issues and gaps** in sago palm research and development and implementation of follow up actions;
- **Establishment and maintenance of a web-site** on sago palm (the web-site will initially hosted by Mei University for four years);
- **Development of a regional strategic framework** on sago palm research, development (including effective and sustainable cultivation and utilization) and conservation, which would serve as a common platform for concerted and harmonized efforts;
- **Conduct of an annual regional meeting**, preferably back-to-back with special sago events and annual sago symposia that bring together a broad range of stakeholders and perspectives that enrich the dialogue on sago palm and enhance collaborative action to promote its sustainable development, conservation and utilization;
- **Formulation of an action plan and/or annual work plan** of the Regional Sago Network and implementation of joint activities as appropriate.

C WORKING MODALITIES

6. Application for membership

Membership of the SNAP will be expanded on an on-going basis. Other organizations/institutions interested in applying for membership in the SNAP will submit a formal application to the Chair. Membership will be approved by the unanimous decision of all SNAP members, either at the annual meeting or through email consultation.

7. Division of work and focal agencies

The SNAP will base its activities on an annual action plan and/or work plan, developed in line with prioritized activities outlined in its Regional Strategic Framework. SNAP members will identify activities on a voluntary basis and will select focal agencies for respective activities/action areas to facilitate collaboration among concerned institutions.

8. Language

The working language of the SNAP will be English.

9. Chair

FAO will chair the SNAP unless requested by a two-thirds majority to step down. At least one of the Vice chairs should come from one of the three main sago-producing countries – Indonesia, Malaysia and PNG. One of the vice-chairs must be a representative of an Institution.

The Vice-chairs would be elected on a bi-annual basis. Vice chairs could stand for election to the Chair after two years. Terms of Reference of the Chair and Vice-chair are included in Annex 1.

Professor Bintoro, of Bogor Agricultural University, and Professor Kopli Bujan of the Center of Excellence for Sago Research, Universiti Malaysia, Sarawak, Malaysia will serve as vice-chairs for the term 2013 through 2015.

10. Voting and election

Decisions on all matters will be made by consensus by members present or represented at meetings. Voting will be used only as a last resort. In case of voting, the following procedures will be observed;

- Participating countries will have the opportunity to serve as Vice-chair on a rotational basis.
- With written power of authority, members may be represented at meetings by another member.
- Any member may nominate a candidate for the office of Chair and/or Vice-chair. If only a single candidate per position is nominated, the meeting may conduct the vote through acclamation.
- If more than one candidate is running for the office of Chair and/or Vice-chair, voting will always be by secret ballot. Each member present or represented will in this case cast its preferred vote in numerical ranking for each candidate. The candidate who obtains the highest ranking (i.e. the lowest number) will be elected. In case of equal ranking, a second ballot will be cast on the same basis.

11. Meetings

Convocation

Meetings of members will be convened by the Chair on an annual basis, or at the request of at least twenty per cent of the membership, to discuss strategic areas of coordination in the SNAP. Additionally, the SNAP may work through video conferences, Skype, email and by other means.

The Chair will seek ways to hold meetings in conjunction with major events such as Sago Conferences. In the case of rapidly emerging issues, the Chair may seek, if necessary, concurrence for convening extraordinary meetings.

Notification

Members will be notified about annual meetings and will be provided with a provisional agenda at least one month prior to the date of the meeting. Documents for deliberation or decision by the meeting, will be provided to members by the secretariat at least two weeks prior to the date of the meeting.

Members will finance their own travel cost to participate in meetings. In exceptional cases, funding support will, however, be made available for the participation of members in annual meetings.

Decisions

Where necessary and with the exception of the application for membership and the election of the Chair and Vice-chair, decisions will be taken by a minimum participation of half of the total number of participating organizations.

Chair

Meetings of members will be chaired by the Chair or, in case s/he is unavailable, by the Vice-chair. The Chair can ask either of the Vice-chairs to co-chair a meeting.

12. Secretariat

FAO will host the secretariat of the SNAP for the initial stage of the network and will provide the technical and operational support required for its establishment and functioning, as outlined in the terms of reference in Annex II.

13. Web-site

The SNAP web-site will be established and maintained by Mie University under the overall management of the Secretariat. FAO will provide oversight to website development.

14. Operational Cost of the Secretariat and Web-site

The operational cost for the Secretariat and for web-site management will be covered by the hosting institution on a voluntary basis. The SNAP will, however, accept sponsorship and financial contributions and donations for joint activities as appropriate, from other member institutions.

ANNEX I

Terms of Reference: Chair and Vice-chair

Chair

The Chair will preside at meetings of the SNAP and will exercise such other function as may be required to facilitate the work of the SNAP. In its capacity as Chair, FAO will ensure that the SNAP procedures and decisions taken by the members are properly implemented.

The tasks include:

- facilitating cooperation between members of the SNAP;
- providing oversight of the planning of meetings;
- chairing meetings;
- approving of minutes of meetings;
- participating, on behalf of SNAP members, in relevant meetings;
- publicizing the work of the SNAP ;
- requesting specific functions to support the work of the partnership;
- performing other functions as may be required to facilitate the work of the SNAP.

Vice-chair

The Vice-chair shall perform the functions assigned to her or him by these terms of reference, as well as those delegated to her or him by the Chair.

The tasks include:

- chairing meetings in the absence of the Chair;
- Monitoring progress of the work plan.
- assist in publicizing the work of the SNAP;
- performing other functions as may be required to facilitate the work of the SNAP .

ANNEX II

Terms of Reference: Secretariat Services

The SNAP will be supported by a secretariat that acts as a networking and liaison point for members, connecting members and activities to ensure greater participation, coherence and impact.

Operating principles

In providing secretariat services, the following operating principles will be applied:

- operate as a support mechanism of the Chair on behalf of the membership;
- build on existing relevant databases and platforms;
- draw on the existing capacities of SNAP members;
- draw on the knowledge and expertise of SNAP members;
- add organizational and technical value to the SNAP ;
- ensure full transparency among members in the operation of the SNAP.

Specific tasks to be undertaken by the secretariat services

On the basis of the above, the secretariat will provide the following services:

- Developing a draft one -year programme of work in close coordination with members.
- Coordinating the implementation of agreed activities within the programme of work.
- Acting as a focal point for information dissemination and communication among members.
- Assistance in establishing and maintaining the SNAP website for the efficient and prompt sharing of information. The website will provide essential and publicly available information on the SNAP, including its terms of reference, programme of work and list of members. The website will set up a virtual forum with restricted access for the sharing of views and information among members. Links will be established between the SNAP website and the individual websites of members.
- Assisting the Chair in convening meetings of the SNAP by preparing and circulating agendas, invitations, draft recommendations and reports before, during and after meetings, undertaking and maintaining communication with the host organization and relevant stakeholders, providing practical financial arrangements/projections for the planning and staging of meetings, and assisting where necessary in logistical services, including but not limited to travel assistance.
- Assisting with the preparation of background documents for SNAP activities.
- Establishing and maintaining a calendar of relevant events and meetings.
- Managing other SNAP outreach activities upon agreement by members.

Annex 6

Strategic Framework

Regional Sago Network for Asia and the Pacific

Strategic Framework



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Strategic Framework for the Regional Sago Network For Asia and the Pacific

A. Introduction

The Strategic Framework for the Regional Sago Network for Asia and the Pacific (SNAP) has been designed to provide an open framework for collaboration among institutions and individuals involved in the research, utilization, conservation and sustainable development of the sago palm. Feedback received through consultation on the Concept Note circulated to inaugural members of the Network in December 2012, has provided a basis for the identification of four thematic areas that would facilitate synergy and collaboration across sago producing countries in the region.

The SNAP is expected to provide a platform for common consensus and joint efforts. In particular, it places emphasis on partnerships among participating institutions and linking researchers with stakeholders and policy makers.

B. Goal and Objectives

The SNAP is a voluntary partnership of stakeholders promoting research, utilization, conservation and sustainable development of sago palm and its products with an overarching goal of enhancing the contribution of sago palm to food security. The SNAP aims to bring together key partners and stakeholders, including researchers, policy makers, public and private sector entities and representatives of civil society organizations (CSOs) and development partners from across Asia and the Pacific Region, with the following specific objectives, which are to:

- Exchange knowledge, share experience and promote collaboration and concerted efforts among all stakeholders on the research, utilization, conservation and sustainable development of sago palm, and advocate for its economic, social and environmental values and benefits.
- Promote effective linkages among research, utilization, conservation and sustainable development of sago palm and reduce the negative environmental impacts.
- Facilitate the development of policies, strategies, regulatory framework and institutional mechanisms associated with sago palm and its products.

C. Dimensions of the Strategic Framework

The strategic framework is built around the following four key thematic areas:

1. Advocacy on sago palm and its utilization
2. Fostering knowledge sharing and networking
3. Fostering innovation
4. Developing appropriate policies and regulatory frameworks

It targets the following stakeholder categories:

- Individual actors in sago supply chains – small holders, small and large enterprises and their employees, marketers, wholesalers, retailers and consumers
- Academic and research institutions such as universities and research centres
- Policy makers and industry-level actors including government agencies, regulatory bodies and Ministries of Agriculture and Environment
- Civil society organisations (CSOs)
- International Organisations and networks

D. Thematic Areas

Details of the four thematic areas of the strategic framework are as follows:

Thematic area 1. Advocacy on sago palm and its utilization

Advocacy is required to promote awareness about the sago palm and its products. Advocacy encompasses many activities including media campaigns, the production of promotional materials, the organization of promotional events, etc.

Target groups: The range of institutions involved in the SNAP and the general public.

Objective 1.1 – To promote awareness about the sago palm and the value of its products.

On attaining this objective, the following outcomes will be realized: (i) Smallholders acknowledge sago palm cultivation as a potential source of income generation; (ii) Governments acknowledge the value of sago production and utilization by providing funds and extension services to the sago sector; (iii) Increased investor interest in the sago sector as investors recognize the economic potential of sago production and development; (iv) Sago users (consumers, industrial buyers / processors) recognize the value of sago starch, sago products and by-products. In realizing these objectives the following outputs are envisaged:

Output 1.1.1	Public forums and campaigns to enhance awareness of sago and its products.
Output 1.1.2	Local curricula on sago production and its utilization for local schools.
Output 1.1.3	Sago learning centres established in sago producing countries.

Output 1.1.4 Sago Day / Sago Year involving participation of core farmers / producers observed in each country.

Objective 1.2 - To advocate for promotion of sago palm research, utilization, conservation and sustainable development.

On attaining this objective, the following outcomes will be realized: (i) Increased coordination in sago research with stronger linkages between upstream and downstream research activities; (ii) Stakeholders aware of and implementing good management practices for conservation and sustainable development of sago palm; (iii) Sago palm utilised more effectively and global output increased; and (iv) Improved cooperation among smallholders, plantation owners / managers and industry. In achieving these outcomes the following outputs are envisaged:

Output 1.2.1 An integrated and comprehensive research strategy and action plan on sago covering upstream and downstream research activities and social studies.

Output 1.2.2 Good management practices, success stories and models for conservation and sustainable development identified and available to stakeholders and the general public in sago producing countries.

Output 1.2.3 Strategies to improve cooperation among smallholders, plantation owners / managers and industry formulated and implemented.

Output 1.2.4 Advocacy campaign package (brochures, video material, pamphlets, etc) available to stakeholders and the general public in sago producing countries and beyond.

Thematic area 2. Fostering knowledge sharing and networking

Relatively limited networking exists among researchers, development agencies and government, and non-government organizations engaged in sago palm research and development across Asia and the Pacific region. Many countries lack a strategic vision and orientation designed to guide sago palm conservation and development for sustainable development of the crop. Coordination within the SNAP will, therefore, encourage the formation of working groups or consortia of institutions in the different thematic areas under the network as well as facilitating the exchange of information among these areas.

Target groups - Academics, researchers, industry, CSOs, government and other stakeholders.

Objective 2.1 - To establish and facilitate a sago palm virtual forum for communication and knowledge sharing.

On attaining this objective, the following outcomes will be realized: (i) Regular exchange of information and ideas among stakeholders; (ii) Increased dissemination of sago related information; and (iii) Improved access to research results on sago palm. In achieving these outcomes the following outputs are envisaged:

- | | |
|---------------------|--|
| Output 2.1.1 | SNAP website established and linked with existing sago related web sites. |
| Output 2.1.2 | Active social networking among stakeholders via Facebook, LinkedIn., etc. |
| Output 2.1.3 | Database of literature on sago created and accessible through the SNAP website. |
| Output 2.1.4 | SNAP mailing / email list created and available. |
| Output 2.1.5 | Video / audio conference focal point in each member country identified and available to members. |
| Output 2.1.6 | Sago email newsletter produced and distributed every 6 months. |

Objective 2.2 - To effectively promote sago networking among stakeholders.

On attaining this objective, the following outcomes will be realized: (i) Improved knowledge sharing; and (ii) Exchange of academic staff and students among institutions in the region based on existing exchange programs in each institution. In achieving these outcomes the following outputs are envisaged:

- | | |
|---------------------|--|
| Output 2.2.1 | Conferences / symposia on sago palm organized and implemented. |
| Output 2.2.2 | Exchange programs for knowledge and experience sharing established among institutions. |
| Output 2.2.3 | Regional Sago Internship Program established including internship to academic and development institutions and industry (processing and production sectors). |

Thematic area 3. Fostering innovation

There is a need to foster innovation in sago development as the outputs of research through innovation (knowledge, methodologies, technologies, new organizational models, etc) are used by stakeholders involved in the development and utilization of the sago palm. Human

resource capacity development is a critical prerequisite toward fostering innovation to deliver sustainable impact.

Target groups - The direct targets of this strategy are key partners and stakeholders, including researchers, policy makers, public sector entities and representatives of civil society organizations (CSOs) and development partners from across Asia and the Pacific Region. Indirect targets are the actors in the sago palm supply chain (small holders and plantation owners, processors, traders, retailers...) and the wider public, including consumers who need to be more aware of relevant issues (food safety, for example).

Objective 3.1 - To promote effective utilisation of sago for food products.

On attaining this objective, the following outcomes will be realized: (i) Renewed interest in the utilisation of sago flour/starch at the global level, by the food industry; (ii) Sago flour / starch used and products promoted / recognized as having comparably high value; (iii) sago flour/starch production guidelines and marketing strategy to promote sago industry globally, (iv) Wider range of sago derived products produced and available on the market; and (v) Increased utilization of sago flour / starch at the household level. In achieving these outcomes the following outputs are envisaged:

- | | |
|---------------------|---|
| Output 3.1.1 | Improved nutritional value (including fortification) of sago flour / starch and sago products. |
| Output 3.1.2 | Extended range of food products (pasta, bread, chips, cookies, etc.) derived from sago flour / starch. |
| Output 3.1.3 | New, environmentally friendly processing techniques and product formulations for using sago flour / starch, in producing products of comparably higher nutritional value. |
| Output 3.1.4 | Novel methods / recipes for preparation of sago flour / starch dishes and products at the household and community level. |
| Output 3.1.5 | Simple, low cost and appropriate technologies for micro and small-scale processing of sago starch / flour. |

Objective 3.2. - To promote utilisation of sago for non-food products.

On attaining this objective, the following outcomes will be realized: (i) Increased use of sago in non-food products through innovation in processing techniques and product diversification; and (ii) Greater use of industrial grade sago flour. In achieving these outcomes the following outputs are envisaged:

- Output 3.2.1** New / improved methods for value addition to sago starch / flour through production of commercially viable non-food products (ethanol, lactic acid, etc).
- Output 3.2.2** Guidelines for the non-food use of sago starch of different qualities and grades, developed for future standardisation across sago producing countries.
- Output 3.2.3** Options for direct utilisation of sago pith without the need for conventional starch extraction.

Objective 3.3 - To promote conservation of sago palm and the environment.

On attaining this objective, the following outcomes will be realized: (i) Reduced displacement of local flora and fauna; (ii) Conservation of sago species; (iii) Environmental impact from development of new sago estates minimized; and (iv) Reduced environmental pollution from sago mills. In achieving these outcomes the following outputs are envisaged:

- Output 3.3.1** Inventory of existing sago forests and natural stands.
- Output 3.3.2** Strategy and action plan for sago palm conservation.
- Output 3.3.3** Good Management Practice identified and introduced to sago stakeholders (including sago mills) for water management and to minimize environmental impact.

Objective 3.4. - To promote the utilisation and management of sago waste.

On attaining this objective, the following outcomes will be realized: (i) Environmental impact from the waste produced by sago mills minimized; and (ii) Waste from sago processing reduced through production of value added by-products. In achieving these outcomes the following outputs are envisaged:

- Output 3.4.1** Improved waste management practices identified and promoted by all sago stakeholders, including new and existing sago mills.
- Output 3.4.2** Value added products from the sago palm, including from its waste and its by-products, identified and promoted.

Objective 3.5 - To enhance cultivation, production & harvesting of sago palm.

On attaining this objective, the following outcomes will be realized: (i) Productivity and production of sago palm improved, (ii) Management skills of plantation managers upgraded; (iii) Improved income of sago farmers; and (iv) Agronomic practices in sago plantations and smallholdings improved. In achieving these outcomes the following outputs are envisaged:

- Output 3.5.1** Plantation managers and sago farmers trained in improved and appropriate farm management practices.
- Output 3.5.2** Increased productivity per land area of sago farms through varietal improvement and other technological innovations.
- Output 3.5.3** Enhanced knowledge and skills of sago plantation owners and small holders in improved agronomic practices.

Thematic area 4. Developing appropriate policies and regulatory frameworks

Policies and regulatory frameworks that are applicable to the industrial scale development of the sago palm would not be adequate for micro- and small-scale enterprises that involve the rural poor. A range of different policy options must, therefore, be considered to address the different levels of sago palm development across countries.

Harmonisation of policies and the development of regulatory frameworks at the local, national, sub-regional and regional level is an important element of this strategy.

Target groups - Policy-making bodies in the public sector at local, national, sub-regional, regional and international levels.

Objective 4.1 - To facilitate governments in formulating policies and in providing an enabling environment for smallholders and plantation development.

On attaining this objective, the following outcomes will be realized: (i) National policy framework supporting sustainable sago production and utilization adopted by governments; and (ii) Improved market access of sago products. In achieving these outcomes the following outputs are envisaged:

- Output 4.1.1** Appropriate policies and guidelines to develop sago industries.
- Output 4.1.2** Appropriate industrial standards for sago starch / flour.
- Output 4.1.3** Appropriate policies and guidelines to safeguard existing natural sago stands /forest.
- Output 4.1.4** Appropriate policies and guidelines to support smallholder farms and plantations.
- Output 4.1.5** Household cultivation of sago promoted through strong government support.
- Output 4.1.6** Social contribution for sago palm conservation promoted.
- Output 4.1.7** Appropriate policies and guidelines to support sago products marketing and value chain development.

Annex 7

Consolidated Work Plan

Work Plan

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)			
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments	
														Total	Available		
Thematic Area 1: Advocacy on Sago Palm and its Utilization																	
Objective 1.1 To promote awareness about the sago palm and the value of its products.	Smallholders acknowledge sago palm cultivation as a potential source of income generation.	Smallholders begin to conserve instead of destroying sago stands	Output 1.1.1 Public forums and campaigns to enhance awareness of sago and its products.	Good attendance in public forums on sago	Japan a. Prepare brochures and leaflets and deliver to target audience									2,000		Yukio Toyoda	
	Governments acknowledge the value of sago production and utilization by providing funds and extension services to the sago sector.	Government allocates more funds for extension services to promote sago conservation and planting		Smallholders relying on sago palm and associated activities for a living		Philippines a. Organize and hold a public Forum								10,000	2,500	Dulce Flores	
							b. Organize and hold a display of novel sago products								3,750		1,250
							c. Conduct awareness seminar on sago flour and starch in different regions of the country										Mario Capanzana
							d. Conduct summits and related activities on sago flour/starch in different regions of the country										
	Increased investor interest in the sago sector as investors recognize the economic potential of sago production and development.	More private investors are interested in sago utilization and expansion		Increased level of sago substitution for wheat ingredients.			Indonesia a. Develop sago villages at Timika District, Papua Province								500,000	500,000	Bintoro
	Sago users (consumers, industrial buyers / processors) recognize the														1,000,000	1,000,000	

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
	value of sago starch, sago products and by-products.															
					Malaysia a. Promote sago starch & products in international starch exhibitions b. Integrate sago R&D into institutional promotion / activities									5,000		Jong
														1,000		Hairul Roslan
					Thailand a. Organize and hold a public forum on sago palm b. Promote sago conservation on public land and initiate creation of household sago gardens c. Develop various media presentations (video, brochures and leaflets), deliver to target audiences d. Develop and deliver marketing promotion packages for sago products e. Organize training program on sago processing and product production for target groups f. Organize and hold a demonstration of sago starch processing and display of novel sago products and sago by-products for educators and students under the Chevron-									3,300	1,600	Yadfon RMUTSV Thungsong TSU.
														3,300		Yadfon
														3,000	2,000	Yadfon RMUTSV Thungsong
														40,000	1,600	RMUTSV Thungsong
														2,000	1,000	Yadfon RMUTSV Thungsong TSU
														12,000	5,000	Kenan Institute Asia

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
					“Increase Science education project”											
			Output 1.1.2 Local curricula on sago production and its utilization for local schools.	Local schools advocate sago conservation via the classrooms	Japan									2,000		Yukio Toyoda
					a. Prepare educational brochures and leaflets											
					b. Identify and deploy lecturers to provide instruction on sago at schools									4,000		
					Philippines									2,500	2,500	Dulco Flores
					a. Revise local school curricula to include sago utilization in Grades 11-12											
					Indonesia									1,000	-	Bintoro
					a. Design a sago course for Faculty of Agriculture in identified Provinces											
					Thailand									7,000	2,600	Yadfon
					a. Promote school sago gardens and provide sago food for students once a week											
					b. Develop a sago curriculum as part of a central curriculum in local schools									500		Schools in Trang, Nakhonsi-thammarat and Phatalung
					c. Develop a course on underutilized crops in faculty of agriculture									1,700		RMUTSV Thungsong TSU NSTRU
			Output 1.1.3 Sago learning centres		Japan									48,000		Yukio Toyoda It is possible to send Japanese to
					a. Deploy sago specialists for a short period to institutes in sago											

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)			
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments	
														Total	Available		
			established in sago producing countries		growing areas											sago growing countries through JICA projects	
					Thailand a. Facilitate establishment of sago learning centres in Nakhonsithammrat and Phatalung									7,000		RMUTSV Thungsong TSU.	
					Malaysia a. Recruit and employ sago specialists on short term contracts to conduct talks on promotional activities in an academic or community setting									10,000		Hairul Roslan	
					b. Attach sago specialist in research centres such as in Manokwari, UP Mindanao and UNIMAS Malaysia												
			Output 1.1.4 Sago Day / Sago Year involving participation of core farmers / producers observed in each country.	Farmers and private investors celebrate sago day	Japan a. Organize and hold sago celebrations in towns and cities									2,000		Yukio Toyoda	
					b. Introduce ways of utilizing sago									1,000			
					Philippines a. Organize and hold one day sago celebration												Dulce Flores
					b. Promote sago products									2,500	2,500		
					Indonesia a. Supervise sago and tuber crops research center at Manokwari												Bintoro
					Thailand a. Organize and hold sago day. Activities to include academic										15,000		Yadfon RMUTSV Thungsong TSU.

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
					conference, exhibition, demonstrations and sago fair											NSTRU Schools
Objective 1.2 To advocate for promotion of sago palm research, utilization, conservation and sustainable development.	Increased coordination in sago research with stronger linkages between upstream and downstream research activities. Stakeholders aware of and implementing good management practices for conservation and sustainable development of sago palm. Sago palm utilised more effectively and global output increased. Improved cooperation among smallholders, plantation owners / managers and industry.		Output 1.2.1 An integrated and comprehensive research strategy and action plan on sago covering upstream and downstream research activities and social studies.	Number of fund raising proposals submitted increased Stakeholders formalize their commitment and advocacy to sago flour production and product development	Japan									4,000		Yukio Toyoda
					a. Promote academic conferences											
					b. Promote publishing of journals and reports									2,000		
					Indonesia									10,000	10,000	Bintoro
					a. Undertake collaborative research with Sampoerna company, especially in the area of Sago Palm cultivation											
					b. Identify sago palm accession at some districts in Papua and West Papua Provinces									1,000,000	-	
					c. Develop high fructose syrup and bio ethanol									5,000,000	-	
					Japan											Tomohide Sugino
					a. Initiate fund raising efforts to support comprehensive sago research											
					Thailand									80,000		Universities and Yadfon
					a. Undertake a cooperative research program among institutions on social, science and technology aspects related to sago palm and disseminate findings to target groups.											
					SNAP/Malaysia											Hairul Roslan
					a. Create a working group to identify research direction for Upstream and Downstream and Social studies											

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
					Philippines											
					a. Conduct advocacy meetings among stakeholders (industry, government and academe)											Mario Capanzana
					b. Organize and hold a road mapping seminar on Sago											
					c. Conduct site visits											
			Output 1.2.2 Good management practices, success stories and models for conservation and sustainable development identified and available to stakeholders and the general public in sago producing countries.	Adoption of management practices by private sectors and in research institutions as pilot or demonstration plots	Japan									2,000		Yukio Toyoda
					a. Develop and produce brochures and leaflets											
					b. Deliver brochures and leaflets to the public									2,000		
					Indonesia									10,000	10,000	Bintoro
					a. Develop best management practices for sago palm cultivation											
					b. Develop small holders sago palm plantation									500,000	500,000	
			Output 1.2.3 Strategies to improve cooperation among smallholders, plantation owners / managers and industry		Indonesia									500,000	500,000	Bintoro
					a. Cooperate with Directorate General of Estate Crop, Ministry of Agriculture to enhance small holders sago plantation in Papua, West Papua, North Maluku, and Riau Province.											

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
			formulated and implemented.													
			Output 1.2.4 Advocacy campaign package (brochures, video material, pamphlets, etc) available to stakeholders and the general public in sago producing countries and beyond.	IEC material developed, tested, printed and distributed	Japan									6,000		Yukio Toyoda
					a. Develop and produce several types of brochures											
					b. Produce several types of video material									30,000		
					Malaysia									20,000		Jong a and b shall go hand in hand. Announcement/call for paper to be made by FAO
					a. FAO updates M. Flach 1983 / publishes a book on the development of the sago industry											
					b. FAO organises a request for article contribution from participants.											
					Philippines											Mario Capanzana
					a. Conduct seminars to LGUS, industry partners, etc. on developing IEC materials											
					b. Develop IEC materials on sago											
					c. Develop product information data sheet on differed sago products											
Thematic Area 2: Fostering Knowledge Sharing and Networking																
Objective 2.1 To establish and facilitate a sago palm virtual forum for	Regular exchange of information and ideas among stakeholders.		Output 2.1.1 SNAP website established and linked with existing sago		All Members/Malaysia a. Organisations/Institutions create own website that can be linked to SNAP											Hairul Roslan

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)						
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments				
														Total	Available					
communication and knowledge sharing.	Increased dissemination of sago related information. Improved access to research results on sago palm.		related web sites.																	
			Output 2.1.2 Active social networking among stakeholders via Facebook, LinkedIn, etc.		Indonesia a. Promote active social networking among stakeholders via Facebook, LinkedIn, etc									1,000	-	Bintoro				
						Thailand a. Regular sago network meeting in south of Thailand b. Promote active social networking among sago stakeholders via an email newsletter								5,000		RDLof RMUTSV. TSU, NSTRU.. Yadfon				
			Output 2.1.3 Database of literature on sago created and accessible through the SNAP website.	Publications made freely available via internet search (key words, authors, topics etc)	Indonesia a. Develop a database of literature on sago and make it accessible through the SNAP website Malaysia a. SNAP/FAO to provide funding to establish such a database. b. All sago related publications (full papers as far as possible) made freely available to the public c. Philippines a. Upload sago information to SNAP website and e-library										1,000	-	Bintoro			
																	Jong			
																				Mario Capanzana
						Output 2.1.4 SNAP mailing / email list created and available.		Indonesia a. Produce a mailing / email list and make it available to the Indonesian Sago Network										1,000	-	Bintoro
			Output 2.1.5 Video / audio conference focal point in each member		Malaysia a. UNIMAS to establish video/audio conferencing facility												Hairul Roslan			

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
			country identified and available to members.													
			Output 2.1.6 Sago email newsletter produced and distributed every 6 months.		Indonesia a. Produce an email newsletter for Indonesian Sago Network members											Bintoro
Objective 2.2 To effectively promote sago networking among stakeholders.	Improved knowledge sharing. Exchange of academic staff and students among institutions in the region based on existing exchange programs in each institution.		Output 2.2.1 Conferences / symposia on sago palm organized and implemented.		Indonesia / Malaysia a. Support the National Sago Symposium, Bogor 5 February 2013									5,000	5,000	Bintoro Jong
					b. Support the International Sago Symposium in Manokwari, November 2013									20,000	-	FAO to support funds for invitation of distinguished speakers to present concepts and/or findings
					c. Support the ASEAN Sago Symposium, Philippine in 2014									10,000	-	
					d. Support the National Sago Symposium, 2015									5,000	-	
					Philippines a. Conduct conferences / symposia on sago palm											Mario Capanzana
					Indonesia a. Promote joint research with Sampoerna company, The Center of Sago Palm and Tuber Crops, UNIPA, and BPPT									80,000	80,000	Bintoro
			Output 2.2.2 Exchange programs for knowledge and experience sharing established among		b. Promote joint activity with Freeport company to develop											

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
														Resources		Comments
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Total	Available	
			institutions.		sago community at Timika District											
					All Members/Malaysia a. Identify and promote joint activities between Research Centres such as The Center of Sago Palm and Tuber Crops, UNIPA, BPPT and CoESAR (UNIMAS)											Hairul Roslan
			Output 2.2.3 Regional Sago Internship Program established including internship to academic and development institutions and industry (processing and production sectors).		Malaysia a. Identify and approach private companies to create a combined fund to offer Internship Program											Hairul Roslan
Thematic area 3. Fostering Innovation																
Objective 3.1 To promote effective utilisation of sago for food products.	Renewed interest in the utilisation of sago flour/starch at the global level, by the food industry.	Increasing number of products utilising sago starch as an alternative to corn or wheat starches	Output 3.1.1 Improved nutritional value (including fortification) of sago flour/starch.	Extended applications of sago flour/starch beyond the existing food/non-food industry	Indonesia a. Develop a rice analogue based on sago starch									10,000	10,000	Bintoro
	Sago flour / starch used and	Improved quality of sago		Fortified sago flour / starch/ rice kernel and	Malaysia a. Promote sago to new users apart from the current uses (which are mainly confined to limited sectors and with little room for expansion)											Jong on going carried out by some private companies

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
	products promoted / recognized as having comparably high value. Sago flour/starch production guidelines and marketing strategy to promote sago industry globally. Wider range of sago derived products produced and available on the market. Increased utilization of sago flour / starch at the household level.	starch produced from all sago mills Increasing percentage of sago based products available in the market		premix and its products	b. Educate potential new users on the properties and potential uses of sago starch											
					Philippines											
					a. Conduct fortification program of sago flour/starch with vitamins and minerals											Mario Capanzana
					b. Introduce product standardization of fortified sago products											
					c. Conduct Shelf-life studies on fortified sago flour/starch and its fortified food products											
					d. Conduct retention studies of fortified sago / starch/ products after cooking											
					e. Utilize sago flour /starch for the production of multi-nutrient rice kernel/premix for rice fortification											
					f. Undertake retention studies using different methods of cooking											
			Output 3.1.2 Extended range of food products (pasta, bread, chips, etc.) derived from sago flour/starch.	Prototype products	Indonesia									10,000	10,000	Bintoro
					a. Develop snack and bread products based on sago starch											
					Malaysia											
					a. Facilitate producers to provide samples and work with food manufacturers/end users to develop and test new products											Jong on going carried out by some private companies

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		Comments	
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources			
														Total	Available		
					Philippines											Mario Capanzana	
					a. Conduct trial formulation and optimization studies												
					b. Develop appropriate product standards												
					c. Undertake quality evaluation of the developed product												
					d. Undertake shelf life studies												
					e. Facilitate technology transfer to industry												
			Output 3.1.3 New, environmental ly friendly processing techniques and product formulations for using sago flour / starch, in producing products of comparably higher nutritional value.	Use of less water in processing, Develop new process without using water Maximize the utilization of main and by products	Malaysia a. R&D carried out by institutions b. Support to encourage open and collaborative R&D by private sector to develop market-driven new products and new processing technologies											Jong On going by some companies	
					Philippines a. Conduct studies on sago flour / starch production using different treatment methods to prevent discoloration and increase extraction rate b. Determine the best technique / technology c. Conduct research on residual contaminants from sago flour/starch production											Mario Capanzana	

[illegible]

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
					c. Undertake transfer of technology to SMEs											
Objective 3.2 To promote utilisation of sago for non-food products.	Increased use of sago in non-food products through innovation in processing techniques and product diversification. Greater use of industrial grade sago flour.	Increasing number and percentage of non-food products produced from, or utilising sago starch	Output 3.2.1 New / improved methods for value addition to sago starch / flour through production of commercially viable non-food products (ethanol, lactic acid, etc).													
			Output 3.2.2 Guidelines for the non-food use of sago starch of different qualities and grades, developed for future standardisation across sago producing countries.													
			Output 3.2.3 Options for direct utilisation of													

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)			
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments	
														Total	Available		
			sago pith without the need for conventional starch extraction.														
Objective 3.3 To promote conservation of sago palm and the environment.	Reduced displacement of local flora and fauna.	Minimised encroachment into original sago farm lands by developers of other cash crops	Output 3.3.1 Inventory of existing sago forests and natural stands.		Indonesia a. Map sago area in Papua and West Papua Provinces										1000,000	1000,000	Bintoro
	Conservation of sago species.	Development of new sago plantations using high yield and early maturation varieties			Malaysia a. Germplasm collection, identification & characterization of indigenous sago palms in various parts of the world									30,000		Jong FAO to employ/coord inate such collection	
	Environmental impact from development of new sago estates minimized.	Development of new sago plantations using high yield and early maturation varieties	Output 3.3.2 Strategy and action plan for sago palm conservation.		Indonesia a. Develop small holders sago palm plantation properly									10,000	10,000	Bintoro	
	Reduced environmental pollution from sago mills.					Malaysia a. Develop and implement mechanisms for the in-situ conservation of indigenous sago tree species									20,000		Jong Concept for development of natural sago forest being drafted
							b. Develop in-situ conservation practice to reduce displacement of existing fauna and flora										
					Output 3.3.3 Good Management practice identified and introduced to sago stakeholders (including sago		Indonesia a. Develop best management practice for water management									10,000	10,000
			Thailand a. Map sago area using GIS in south of Thailand										16,000		NSTRU..		

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
			mills) for water management and minimized environmental impact.													
Objective 3.4. To promote the utilisation and management of sago waste.	Environmental impact from the waste produced by sago mills minimized. Waste from sago processing reduced through production of value added by-products.	Shift of the public perception that sago industries pollute waterways Manufacture of value-added products from sago waste Production of single cell protein, biodiesel and bioethanol from sago wastes	Output 3.4.1 Improved waste management practices identified and promoted by all sago stakeholders including new and existing sago mills.		Indonesia									5,000	5,000	Bintoro
					a. Develop methods for the utilisation of sago waste as a seedling media											
					b. Develop methods for the utilisation of sago waste for bio-pesticides									5,000	5,000	
					c. Develop methods for the utilisation of sago waste for bio-fertilizers									5,000	5,000	
					d. Develop methods for the utilisation of sago waste for sago worm media									5,000	5,000	
					e. Develop methods for the utilisation of sago waste for fish feed									5,000	-	
					f. Develop methods for the utilisation of sago waste for livestock feed									5,000	-	
					Malaysia									15,000		Jong Design in progress, need equipment fabrication and testing
					a. Carry out R&D to separate sago fiber and starch by reducing the use of water, either by recycling or develop a new process that minimize the use of water											
					b. Develop methods to use effluent											

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
					waste in energy production (bio-gas generation)											
					Thailand a. Develop methods for the utilisation of sago waste for sago worms, bio fertilizers and animal feed.									27,000		RMUTSV TSU. NSTRU. Yadfon
			Output 3.4.2 Value added products from sago palm, including from its waste and by-products, identified and promoted.	Technologies developed and promoted	Indonesia a. Develop methods for the utilisation of sago bark chips as raw material for organic heate									10,000	-	Bintoro
					Malaysia a. Develop methods to use sago bark and fibre in power generation											Jong On going by some private companies
					b. Develop methods to use sago fibrous waste in animal feed or biomass fuel											
					c. Develop methods to use fibrous waste in composting, mushroom cultivation etc											
					Philippines a. Utilization of sago waste trimmings / barks for furniture											Mario Capanzana
					b. Utilization of sago waste as an alternative source of energy (biogas/fuel)											
					c. Conduct livelihood trainings for the utilization sago by products/wastes											

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
Objective 3.5 To enhance cultivation, production & harvesting of sago palm.	Productivity and production of sago palm improved.	Increased in production and export of sago starch	Output 3.5.1 Plantation managers and sago farmers trained in improved and appropriate farm management practices.		Indonesia a. Develop and hold training on cultivation, production & harvesting of sago palm for farmers									10,000	-	Bintoro
	Management skills of plantation managers upgraded.	Sago industry becoming an important choice in land development by local governments			Thailand a. Undertake sago ecology management, cultivation and utilization.									3,000	1,600	RMUTSV
	Improved income of sago farmers.															
	Agronomic practices in sago plantations and smallholdings improved.	Rapid and global development of new sago plantations	Output 3.5.2 Increased productivity per land area of sago farms through varietal improvement and other technological innovations.		Indonesia a. Introduce best accession to new area sago plantation									10,000	10,000	Bintoro
			Output 3.5.3 Enhanced knowledge and skills of sago plantation owners and small holders in improved agronomic practices.		Indonesia a. Develop and hold training on cultivation, production & harvesting of sago palm for local government									10,000	10,000	Bintoro

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)				
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments		
														Total	Available			
Thematic area 4. Developing Appropriate Policies and Regulatory Frameworks																		
Objective 4.1 To facilitate governments in formulating policies and in providing an enabling environment for smallholders and plantation development.	National policy framework supporting sustainable sago production and utilization adopted by governments. Improved market access of sago products.		Output 4.1.1 Appropriate policies and guidelines to develop sago industries.	Approved policies and guidelines for sago flour industries for implementation	a. Create an advisory board for sago from various government agencies											Mario Capanzana		
					b. Create sago technical working group from various stakeholders													
					c. Formulate strategic plans for sago													
					d. Formulate of policies and guidelines to sago industries													
			Output 4.1.2 Appropriate industrial standards for sago starch / flour.	Approved standards for sago flour/starch for implementation	Philippines	a. Develop standards for good manufacturing practices for sago flour / starch production												Mario Capanzana
						b. Formulate Philippine National Standard for locally produced Sago flour.												
						c. Conduct a risk analysis study on sago flour/starch												
					Output 4.1.3 Appropriate policies and guidelines to safeguard existing natural sago stands / forest.			SNAP	a. Develop a harmonised policy and guideline on sago diversity conservation and management									10,000 (travelling)

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
			Output 4.1.4 Appropriate policies and guidelines to support smallholder farms and plantations.		Indonesia a. Develop guideline for sago seedling production b. Develop guideline for sago cultivation c. Develop guideline for sago processing									5,000	5,000	Bintoro
														5,000	5,000	
														5,000	-	
			Output 4.1.5 Household cultivation of sago promoted through strong government support.		Indonesia a. Develop and propose a local rule for sago palm conservation									1,000	-	Bintoro
			Output 4.1.6 Social contribution for sago palm conservation promoted.		Indonesia a. Promote sago palm as staple food beside rice b. Promote small holder sago as a means to prevent deforestation of natural sago forest									1,000	-	Bintoro
														1,000	-	
			Output 4.1.7 Appropriate policies and guidelines to support sago products marketing and value chain development.		Indonesia a. Engage commercial chambers to support sago product b. Engage large scale companies to support sago product									10,000	10,000	Bintoro
														10,000	10,000	
					Thailand a. Promote sago palm community forest									8,400		Yadfon TSU

OBJECTIVE	OUTCOME	OUTCOME INDICATOR	OUTPUT	OUTPUT INDICATOR	ACTIVITIES	2013				2014				Budget (in USD)		
						Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Resources		Comments
														Total	Available	
					b. Encourage government organizations to support regulation for public use sago palm									2,000		Yadfon

Annex 8

Participant List

Expert Consultation on the Establishment of A Sago Network for Asia and the Pacific

21-22 March, 2013

**FAO Regional Office for Asia and the Pacific
Main Conference Hall**

List of Participants

FIJI

Dr. R.J. Watling
NatureFiji-MareqetiViti
Box 2041, Government Building
Suva
Tel: 679-338-3189
Fax: 679-3381818
EM: watling@naturefiji.org

INDONESIA

Prof Dr. H.M.H. Bintoro
Faculty of Agriculture
Bogor Agricultural University
Kampus IPB Darnaga
Bogor
EM: uptbsipb@indo.net.id, ubipb@indo.net.id, hmh_bintoro@yahoo.com

JAPAN

Dr. Hiroshi Ehara
Professor and Vice President
International Affairs, Mie University
Graduate School of Bioresources
1577 Kurimamachiya-cho, Tsu 514-8507
Tel: +81-59-2319495
Fax: +81-59-2319495
EM: ehara@bio.mie-u.ac.jp

Dr. Shigeru Kushima (Hisajima)
Vice President
Okazawa Co.Ltd. Japan
Saiki 1844-2, Tsukuba, Ibaraki, 305-0028

Tel: +66-29-838-0152
Fax: +66-29-838-0152
EM: sagomsn@hotmail.co.jp)

Dr. Ayaaki Ishizaki
Professor Emeritus
Kyushu University
No. 611, 1-10-1, Meinohama, Nishi-ku
Fukuoka-shi
Tel: +81-92-882-6647
Fax: +81-92-882-6647
EM: Ishizaki.ayaaki.601@m.kyushu-u.ac.jp or ayishizac@kyudai.jp

Prof. Yukio Toyoda
Rikkyo University
1-2-26 Kitano, Niiza-shi
Saitama
Tel: +81-48-471-7453
Fax: +81-48-471-4538
EM: ytoyoda@rikkyo.ac.jp

Dr. Tomohide Sugino
Representative, Southeast Asia Liaison Office
Japan International Research Center for
Agricultural Sciences (JIRCAS)
50 Phaholyothin Rd., Ladyao
Chatuchak, Bangkok 10900
Tel: 662-5614743, 662-9405755
Fax: 662-9405949
EM: tosugino@jircas.affrc.go.jp

MALAYSIA

Dr. Hairul Roslan
Associate Professor
University Malaysia Sarawak (UNIMAS)
Faculty of Resource Science and Technology
Sarawak 94300
Tel: +601-7231-1716
Fax: +608-2583160
EM: hairulroslan@hotmail.com

Dr. Kopli B. Bujang
Professor
Universiti Malaysia Sarawak (UNIMAS)

Jalan Dato Mohd. Musa
94300 Kota Samarahan, Sarawak
Tel: +6082-583027 (office)
Mobile: +6019-8882308
Fax: +6082-583160
EM: bkopli@pps.unimas.my, bkopli@frst.unimas.my

Mr. Zaidell Bin Hussaini
Head, Corporate Services Division
CRAUN Research Sdn. Bhd.
Lot 3147, Block 14, Jalan Sultan Tengah
93055 Kuching, Sarawak
Tel: 082 446489 Ext 212
Fax: 082 447385
EM: zaidell@craunresearch.com.my

Dr. Noraini Busri
Acting Head
Upstream Technology Division (UTD)
CRAUN Research Sdn. Bhd.
Lot 3147, Block 14, Jalan Sultan Tengah
93055 Kuching, Sarawak
Tel: 082 446489 Ext 213
Fax: 082 447385
EM: drnor_craun@yahoo.com

Dr. Jong Foh Shoon
No. 139 Jalan Inan 4
Jaman Iskandar, 80050 Johor Bahru
Jojore
Tel: +60-16-7014469
EM: fsjong06@yahoo.com

PHILIPPINES

Dr. Dulce Flores
Professor
University of the Philippines Mindanao
Mintal, Davao City 8000
Tel: 6382-2930302
Fax: 6382-2930302
EM: dmflores_2000@yahoo.com

Mr. Mario V. Capanzana
Director IV

Food and Nutrition Research Institute
Department of Science and Technology (DOST)
General Santos Avenue, Bicutan, Taguig City
Tel: 632-837-2934 and 632-839-1839
Fax: 632-837-2934
EM: mvc@fnri.dost.gov.ph or mar_v_c@yahoo.com

THAILAND

Dr. Klanarong Sriroth
Associate Professor
Department of Biotechnology
Kasetsart University
50 Ngamwonwan Rd., Lat Yao, Chatuchak
Bangkok 10900
Tel: 02-9405634
Fax: 02-9405634
EM: aapkrs@ku.ac.th

Dr. Pathama Chatakanonda
Researcher
Kasetsart Agricultural and Agro-Industrial
Product Development Institute
Kasetsart University
50 Ngamwonwan Rd., Lat Yao, Chatuchak
Bangkok 10900
Tel: 02-940-5634
Fax: 02-942-8604
EM: aappmc@ku.ac.th

Mr. Nipon Jaipuem
Associate Professor
Faculty of Agriculture
Rajamangala University of Technology Srivijaya
109 Moo 2, Tamyai Subdistrict, Thungsong District
Nokornsrihammarat Province 80110
Tel: +66-89-744-4521
Fax: +66-75-329-936
EM: niponrit@hotmail.com

FAO-RAP

Mr. Hiroyuki Konuma
Assistant Director-General and
FAO Regional Representative for
Asia and the Pacific

FAO Regional Office for Asia and the Pacific
39, Maliwan Mansion, Phra Atit Road
Bangkok 10200
Tel: 02-6974222, 02-6974310
EM: Hiroyuki.Konuma@fao.org

Ms. Rosa Rolle
Senior Agro-Industry and Post Harvest Officer
FAO Regional Representative for
Asia and the Pacific
FAO Regional Office for Asia and the Pacific
39, Maliwan Mansion, Phra Atit Road
Bangkok 10200
Tel: 02-6974194
EM: Rosa.Rolle@fao.org