

# ASEPS Round-Table

## ASEPS:

### “Physics Towards Science Innovation”

#### **Panelists:**

Etienne Augé; David Cope; Maciej Kolwas; Stefan Michalowski; Shoji Nagamiya; Aleksander Skrinskiy; Andreas Trabesinger; Jia'er Chen; Rajiv V. Gavai; Hyeonsik Cheong; Toshiki Tajima (convener)

*Panelists do not necessarily represent the organisation or institutions they are affiliated to.*

#### **Presentation:**

- **Etienne Augé** (EA) : Particle Physics (France), Deputy Director of IN2P3 (CNRS)
- **David Cope** (DC); (UK) Nottingham University, Research institute in Cambridge (11 years), British Houses of Parliament (12 years).
- **Maciej Kolwas** (MK); (Warsaw, Poland) Atomic physicist (Laser optics), President of EPS (European Physical Society).
- **Stefan Michalowski** (SM): (OECD), Former particle physicist , Executive Secretary of the Global Science Forum.
- **Shoji Nagamiya** (SN); (Japan) Director of the J-Parc Center, Vice-President of Japan Physical Society (President this fall), member of the Science Council of Japan, Chair of the Physics Division.
- **Aleksander Skrinskiy** (AS): (Novosibirsk, Russia) Director of the Institute of Nuclear Physics; Development of accelerators for particle physics and other applications
- **Andreas Trabesinger** (AT): (UK) Senior Editor of “Nature physics”, background in chemical and medical physics.
- **Jia'er Chen** (JC): (China) accelerator physicist, Academician, former president of Peking University and of the Chinese National Science Foundation, currently vice-chairman of ICSU-China.
- **Rajiv V. Gavai** (RG) (India), high-energy theorist, Tata Institute of Fundamental Research.
- **Hyeonsik Cheong** (HC)(Korea), Member of the Korean Physical Society, secretary of the international cooperation committee, semi-conductor physics, Sogang University in Seoul.
- **Toshiki Tajima** (TT)(Japan)(Convener) Laser physics: 30 years in the US (universities), 6 years Japan (Photo science Institute), now at Ludwig-Maximilians University (Munich Germany).

## Executive Conclusions

*to be handed to the Task Force (in italic comments from the organisers)*

- **The physicist's responsibility toward society.** ASEPS "Physics towards science innovation" is an attempt, at the global level, to federate human and financial resources beyond national boundaries and segmented science fields in order to propose interdisciplinary solutions to the most urgent societal needs, including those related to energy, environment and health issues.
- **ASEPS will promote physics and its interactions with the other sciences** so as to increase its visibility to the public, and to decision and policy makers in the hope of getting a fair share of the R&D global spending including for basic science. Investment in basic research is small compared with the investment on innovations that actually uses the results of basic science. The media will be generally invited to ASEPS events so as to contribute to the outreach. *ASEPS will make all efforts to offer web sites attractive to the public.*
- **"Small science" is a major component of the ASEPS agenda.** It is also a motivation for the stronger involvement of the industry.
- **Large international projects are a unique opportunities for developing countries to bridge the knowledge gap.** *This is major motivation of ASEPS.*
- **ASEPS, between Asian and European Countries, is the first step towards a balanced world in terms of research activities and infrastructures.** It is an encouragement for other initiatives in this direction, either scientific or political. *In this first stage non-ASEPS regions have observer status.*
- **ASEPS will promote dialogue with other physics partners,** decision makers and industry representatives. This complex issue needs to be addressed. It is a part of ASEPS' identity. *For this purpose working group 5 has been created "Enabling and improving the dialogue between scientists, decision makers, industry and society".*
- **The Task Force endorsed by AAPPS and EPS ("Tsukuba Declaration") has the charge to form the ASEPS Global Structure.** This implies defining the stakeholders, the funding model, the internal organisation and the conditions for better communication between the partners. In addition it will act as the executive committee for organisation of the next Summit. National/Regional Physical Societies will play a central role both for scientific and organisational issues and will promote the involvement of young scientists.
- **ASEPS must be integrated into the general picture of existing organizations (UNESCO, OECD, ...), but should keep its own identity.**
- **ASEPS Asia-Europe cooperation will come by steps;** from country-to-country to region-to-region partnerships. This will complement the promotion of more unity among the Asian countries. *It should be noted that the European Union Commission R&D budget represents only 3.5 % of the R&D spending of the European countries. So each country, individually, has an important role. Similar to the ESFRI initiative, a first road map for the large infrastructures and networks has been established in Japan.* It is an excellent basis for nurturing discussions between Asian and European potential partners.
- **ASEPS will discuss the implementation of joint centres,** laboratories, schools and students/researchers exchanges as well as internet sites and tools to fulfil the needs of the Asia-Europe physics community, including a list of all available facilities. *In addition to the <http://aseps.kek.jp>, wiki sites already exist <http://aseps.in2p3.fr>.*

## Round-table topics (90')

1. What is **Research Cooperation** all about ? (20')
  - Aggregation of financial supports
  - Benefiting from wider expertise
  - Innovation arising from cultural diversity
  - Advantages/disadvantages using different funding systems
  - Cooperation and competition
  - Research as a pilot project for political cooperation endeavors
2. ASEPS: On the importance of **Asia-Europe Cooperation** (20')
  - Building a balanced America-Asia-Europe triangle for Research
  - Involving developing countries, a case study
  - First attempt to building multi-lateral research structures (region to region)
  - Common history induces ties and duties,
  - Wide cultural diversity: in science development, political and economical systems, religions
3. ASEPS Main Missions (20') see next page
4. ASEPS implementation: (30')
  - Statements to trigger future steps
  - Possible organisations ?

### Topics proposed by the organisers

Provocative statement by the convener (TT) to initiate the discussion

As a physicist working for a long time on basic research on laser physics with a free spirit of physics investigation not obsessed by any practical applications, precisely because of this I feel my own moral obligation when I see now the world in this 21<sup>st</sup> century facing global challenges, global issues. I think that nowadays we physicists should not overlook these issues. We are asking the tax payers, more resources and larger budgets; in return we should get together, and as far as our expertise is useful, get organized to address these global issues.

ASEPS "Physics towards science innovation" is a first attempt to federate, at the global level, human and financial resources beyond national boundaries and beyond the segmented science fields in order to propose interdisciplinary solutions to the most urgent social needs (+EA).

(JC) ASEPS missions: Physics is the cornerstone of science and the basis for the development of technology (nanotechnology, IT ...). But more importantly, global issues like climate change, environment issues, all those mentioned before can be tackled by physics approach both genuinely and efficiently. This should give physics a privileged position in policy-maker minds related to funding budget, unfortunately this is not the case. For instance in China, the National Science Foundation (NSFC) have seen its budget increased by 30% per year for 5 years. But the general math and physics department including astronomy, mechanics ... only get 15% and, only a small share remains to pure physics. But paradoxically, physics now requires expensive large scale infrastructures both domestic and international, so there is a widening gap between the needs and the funding capacity.

So involving the scientists, the decision makers, the industry and the society in the decision process of ASEPS is the right approach. It will certainly help decision makers to understand the importance and the needs of physics and that will help the growing of science, technology and physics in this region and especially for developing countries in Asia. There are more developing countries in Asia, because Asia started modern science 200 years after Europe.

I think in this way, we can help setting up the balanced triangle (between America, Europe and Asia) as presented in the opening ceremony.

For the implementation of this mission ASEPS should first consolidated it-self and become strong international organization and a strong voice to reach the big organizations like EUNESCO, ICSU

or OECD. They can hear about the needs of the physics community. The physical societies can feel strongly the ASEPS support and that will help them both domestically and internationally. To set up the organization ASEPS should form some kind of board of trustees ...

(TT) let's keep this topics for a latter discussion, let's try to focus now on the motivations

(MK) In Europe we also have this kind of discussions, on the role of physics and its interplay with other sciences. Sometimes we are told from the proponent of the other research fields that this is the end of physics, the death of physics because we have to spend too much money, to build too large equipments. We are asked to stop doing physics and teach students the basis of physics and useful technology, but not to spend so much time and money for your curiosity only.

ASEPS has shown that we are not working for our curiosity. We cannot stay in a Universe of which we know only 4%, that can turn out to be very dangerous.

We have also seen that physics plays a big role in studying the brain, actually the brain is working like the physical societies, by regions... it should be a good example for ASEPS !!! and as shown for the brain, the regions need to have strong liaisons between them, ASEPS should build these liaisons between the physical societies of the different regions. In case of trouble each region can help the other; it is a matter of security. This common brain (ASEPS) is reinforcing the stand of each of its elements.

(SM) When creating a new organisation, one has to ask about how it will be seen from the outside. Here we are talking about ASEPS as a venue for bringing together very different entities: governments, funding agencies, the scientific communities, the scientific organizations or institutions, the laboratories, the individual scientists, industry, civil society. These are very diverse elements and this is not a natural mixture for people to talk together. This communication is very difficult to achieve. For example, the relationship between funding agencies and the scientists is essentially an adversary one, because the scientists have good reasons to request support and the funding agencies do not have enough budgets to satisfy all requests. Scientists are free to express their opinions, but government officials are very restricted in what they can say or do, because they are committing their government.

So you have first to define what ASEPS really is in a formal sense. Under which auspices is ASEPS created? Who is funding it? Is it fully independent? Who are its members? What are the organisation procedures? If ASEPS makes recommendations, from whom are they made, on what authority, and to who they will be presented?

Just to illustrate this,, OECD is clearly an intergovernmental organization. We know what our role is, everybody knows what the status of our statements is, what our results are, where they come from and to who they are addressed.

It is easy to want to make a bridge between these different communities, but how to do it, actually in practice, is very difficult. So it is worth seriously thinking about in the months to come.

(DC). TT has been rather pessimistic in his introduction. I fully accept that many economies and my own, in particular, are facing a short set of problems, but I do not detect any retreat away from the general public and most politicians' recognition of, and sympathy for, the scientific endeavour generally, beside a few peripheral things which do not, really, have much significance.

I am really quite optimistic ... so you should be reassured.

(TT) I only felt a moral obligation, that's all

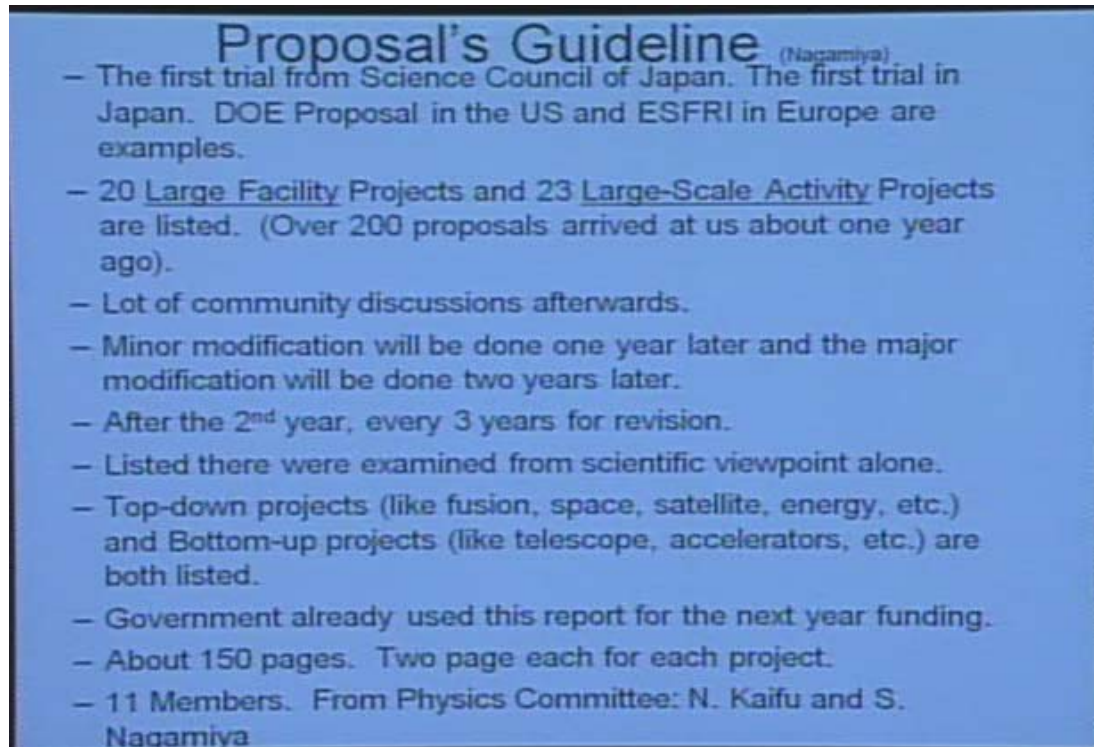
(DC) That recognized, the opinion polls done in different countries show that the general public feels a strong sense of confidence in and respect for scientific activity .

Why Asia-Europe ?... seems to me it is a useful thing to be doing, maybe, even a pioneering thing, because I see the strengthening of the bridges across the entire field, and it is true that for the past 60 or even 100 years we have not really seen the realization at full capacity of interchange be-

tween Asia and Europe generally, and it would be a wonderful thing if we could point to the initiative physicists are taking in encourage other people, other disciplines and other forums to strengthen that relationship ...

So that why I support it very much this project

(SN) The Japanese Roadmap. Similar to the DOE or ESFRI projects, the Science Council of Japan selected last week 20 large facilities and 23 large scale activity projects among 200 proposals on a recommendation list.



**Proposal's Guideline** (Nagamiya)

- The first trial from Science Council of Japan. The first trial in Japan. DOE Proposal in the US and ESFRI in Europe are examples.
- 20 Large Facility Projects and 23 Large-Scale Activity Projects are listed. (Over 200 proposals arrived at us about one year ago).
- Lot of community discussions afterwards.
- Minor modification will be done one year later and the major modification will be done two years later.
- After the 2<sup>nd</sup> year, every 3 years for revision.
- Listed there were examined from scientific viewpoint alone.
- Top-down projects (like fusion, space, satellite, energy, etc.) and Bottom-up projects (like telescope, accelerators, etc.) are both listed.
- Government already used this report for the next year funding.
- About 150 pages. Two page each for each project.
- 11 Members. From Physics Committee: N. Kaifu and S. Nagamiya

**Japanese roadmap (from SN)**

In Japan this effort has just started and it is quite behind what has been done in Europe, so extending it to the whole Asian region is even further away. To extend to China and Korean means much more efforts. In Japan, the decision for the large scale project funding is quite chaotic. This work should help making the decision easier. We are making every effort to progress in this direction. Asia is growing so these approaches are very important

(TT) ESFRI in Europe has been very pivotal to targeting important research area and for promoting unity among European Countries, so it is a good learning example.

(EA) In addition, the large projects of the ESFRI list are long term projects. This offers unique opportunities for emerging countries to join. They have 10-20 years to really get involved. There is a strong connection between the big projects and the involvement of the developing countries.



(TT) let turn now to the missions of ASEPS, the topic has already been touched, but any other comments.

## ASEPS Missions

- ASEPS is a **platform to forge Asia-Europe** physics program/infrastructure **strategies**:
  - A unique forum for: *Scientists, Decision makers, Industry rep., the Society*
  - Decision maker meetings
    - Funding Agency executive meetings (EuroHorcs-AsiaHorcs)
    - Ministry level meetings in coordination with ASEM
  - Integrated with the other existing bodies (*like IUPAP, ICFA, ICUIL, IUA, FALC, NuPECC...*), meetings at Int. Conferences
- To develop **bi-regional cooperation**:
  - Supporting bi-regional physics actions/structures for education and research: Asia-Europe Schools, Asia-Europe Joint Lab. with the involvement of the dev. countries. *Beyond bi-lateral initiatives (France-Japan, UK-China, ...)*
  - Focusing on specific projects initiated by Europe or Asia: *ESFRI, New B fact., ...*
  - Building Asia-Europe Human Networks supported by International Workshop Centers
  - Supporting efforts for building regional organizations (ERA, ARA ??)
- To promote **synergies** between different fields of physics and between physics and **other research fields**: *biology and health, environment, energy.*
- Education and training, gender imbalance (physics needs women)

### Mission as proposed by the organisers

(AS) I have, in many senses, different views and I try to correct what has been said before. The analysis of high-energy collisions, the study of the early universe, the development of accelerators have brought us many information on the matter and cosmos structure. So 50 years of collider development has been useful. Developments in this direction are still very interesting, although different, but important to the understanding of the universe.

Another point related to basic science and applications. The study of the deep structure of matter, of nature and the development of appropriate technologies give, with time, very useful application see for example, the use of synchrotron radiations, technological accelerators, new ways to save energy and to minimize pollution. New technologies bring a lot to our lives.

The part of what is invested in basic science is very small compared to what is invested in the development of innovations that actually use the result of basic science.

In addition, there also a legal difference between basic and applied research: basic science is open science to all scientists, to everyone, but when we shift to the applications of the results of basic science, the problems of intellectual properties, of commercial secrets, ... come in and make everything much more complicated. I do not know the way to resolve this problem.

(TT) Another issue, following your point is the way the society makes use of the basic science outcomes. New advances can translate in both benefits and problems for the society and this goes beyond industry or even beyond government to make the right decisions.

In a way physics in the 20<sup>th</sup> century have been so successful that, nowadays, physics is making global impact both in the society and on the planet

(HC) In Shanghai, when we had the first ASEPS meeting, we were discussing to get together all the physics “stakeholders”, policy makers, physicists and industry but we fail to attract the industry, one reason is that we have been concentrating too much on the big projects although most of the industry interests go towards small science because this is where the real world application and innovation occurs faster.

So, for the future, ASEPS should give more room for “small sciences”. In big science we need large scale and expensive facilities, in “small sciences”, we look for networking opportunities. ASEPS could provide such a platform where scientists could meet and could talk about collaboration and this would promote a stronger cooperation.

As for the future of ASEPS, we need also to get more direct involvement of the National Physical Societies (NPS) both in Europe and Asia, in order to get all the scientists aware and informed about ASEPS activities. Only a few NPS are represented here today.

(AT) Related to the spreading of knowledge between scientists, it is also important to address public outreach. It is important to show that the practical things like the laser or MRI, as was shown today, all started from basic research, with a very small investment as it was said previously and turned out to be a huge service to society. These points have to be stressed and communicate to the end users.

As it was said in the addresses on the first day, in a lot of countries the public must be made aware of what physics is good for, why it worth investing in physics, why it is interesting for the kids to go studying physics and why the public should support the investment in physics

(TT) Working groups:

### Problem-Solving Working Groups

- **WG1: Large scale science platforms for future projects**
- **WG2: New initiatives for inter-disciplinary and innovative frontier Research**
- **WG3: Developing countries and emerging economies involvement, Training and nurturing young scientists.**
- **WG4: Removing barriers and creating new opportunities in international cooperation between Europe and Asia.**

**Working groups created at the Shanghai Kickoff meeting**

Any comments or volunteering to get involved in these working groups ?... more generally any comments about the ASEPS committees, and global organization.

(MK) It is difficult to comment on this, but as far as the future organization is concerned, as a start, I think we should setup an executive committee, for every day decision and to take responsibility for the nominations and so on. This committee could be formed by the Physical societies. Anything else can be ok but probably less efficient.

(From the audience: N.M. Butt): Whenever a new organization is formed, someone should offer a location to host the organization, then the executive committee can be formed and the working groups or the committees. The location is important for sustainability and to initiate the process. Asia or Europe should offer a place. Someone has to start with a positive offer.

(From the audience: M. Shamsheer Ali) I think there is a general consensus on the objectives and the missions of ASEPS. Now, how do we realize our objectives, what is the modus operandi? These are the important issues.

Japan has started this initiative and many countries are cooperating with Japan, but I think we should form a small committee has to be in contact with each countries to adapt to each specific requirements.

Although developing countries have been involved in physics research, thank to ICTP and others, they have never been involved in big projects, especially in the experimental side.

They are many opportunities related to energy or environment where they could contribute.

A proposal would be to prepare a list of physics facilities in Europe and Asia with the contact points, maybe through the physical societies or applied physics societies, so that every country would know the possibilities offered by these infrastructures. They would select those which fit the best each country priorities. What is needed is: 1) description of the physics infrastructures, 2) the main focal point of the facilities 3) the contact person best suited to tackle practical issues, training and technology transfer. IUPAP and IAP(S?) are organization that can help supporting researcher exchanges.

(TT) Internet can be quite useful here; making a specific web site is maybe a solution

(From the audience: S. Hameed Khan) If no unexpected breakthrough occurs, the large scale infrastructure we are discussing today are projects for the next 20 years, and are there for a very long period.

I agree that a location for ASEPS in Japan would good. But do not forget about China reaching already 80% of Japan spending in R&D. So China and Japan are the 2 main poles for research in Asia.

The key issues of the 21<sup>st</sup> century is Energy, so although basic physics is important, ASEPS should get strongly involved on this issue because this is what decision makers are mostly interested in. The structural (logical) physics is well suited to biology, so there should be a better links between physics and biology. Without biology coming in, big physics may not survive.

(From the audience: U. Becker ?) Link to the National Physical Societies is very important, in particular to get the young people involved in the ASEPS project. ASEPS should ask the NPS to name a contact to the working groups/committees. ASEPS should not be only a high level meeting; it should have the roots on the young researchers which are the most active contributors

(TT) ... the organizers are very conscious of this issue as they did involve EPS and AAPPS.

(SN) In addition the Physical societies in Asia like the Japanese, the Chinese and the Korean should be more united and that should go before larger extensions to Asia and to Europe.

(MK) Obviously we will contact all national Physical societies, but we should do the building of ASEPS by step, by test and trial. I am very keen at getting the young researcher involved; this is the only way for a sustainable cooperation.

I just signed the ASEPS Task Force agreement with the AAPS president just to start organizing ASEPS and we have many discussions with the other country NPS representative here at this Summit.

(From the audience SP Chia) ASEPS is a good idea, however the deployment of EPS and AAPPS are at a very different stage and moreover in Asia, the developments of physics are very different and that unevenness is of a much higher scale that what you have in Europe. So we have to achieve some level of unity between the main Asian countries. Japan, Korea, China and India could take the lead and forge a united platform, so that we can talk to EPS and Europe with a unified voice and strength.



(RG) European Physical societies are well united under the EPS umbrella since a long time. Asian physics and physical societies are just catching up and we have still a lot to do. To me, forming an Inter-Asia cooperation is a much stronger point than setting up Asia-Europe cooperation. It is a little presumptuous to talk about Asia and Europe cooperation when Asia research does not exist as such. If we could talk about Asian common schools and joint laboratories that would already be a good thing for ASEPS.

(MK) I do not think you need to unify the whole Asia-Pacific region before we start talking to each other. As long as we have common project, let's do it together and the building of Asian physics come naturally in this process.

(SN) So why did you made the European cooperation...

(MK) because we have many small countries in Europe .... and they cannot exist compared to China or even Japan... the whole Europe is much smaller than China !!!  
In Europe what have been fighting for 2000 years, to stop this we had to build one nation. like the Roman empire whose survived 1500 years ... !!

(TT) What about the next ASEPS?

(EA) it is clear that a second summit should be held as soon as progresses are achieved and this is strongly connected with the setting up of the working groups or work to be done.

The first goal of ASEPS is to promote relations between Europe and Asia. In France, we feel the need to have cooperation with the Asian countries. Back to France it part of my duty to have discussion with our partners in Europe on how the different European countries are seeing their co-operation with Asia. The main goal is to go from country to country cooperation to region to region cooperation.

There is a part of ASEPS about discussion/decision on the big projects which is important, but even more important is to create a stronger link between the communities; the question of bridging doctoral student courses, supporting more visitors, more post-docs, setting up common doctoral schools have to be a high ASEPS priority.

(From the audience: Dong Pil-Min)

ASEPS is a forum for scientists, decisions makers, industry representatives and the Society. I would like to propose to add a 5<sup>th</sup> working group to what has been shown.

This working group would help developing more free conversation, more dialogue with the scientists' partners.

Because when we make discussion between scientists we can come relatively easily to an agreement, but as mentioned by (SM), we have to give much more effort to convince the other partners and this discussion raises, in return, more arguments between the scientists.

We have established many detailed subjects in ASEPS to start with, not just global ideas. Other forums exist like STS or the World Science Forum with their own rationales and approaches to which we may or may not stick to. We want to have our own identity in ASEPS.

(AS) Two points:

1) America (North and South) should not be separated from our activity. (TT) remember the triangle shown at the beginning ... (AS) but I mean in our discussion...

2) Web sites can be used to easily interact to exchange our view...

(From the audience: Chuang Zhang) 1) This summit is a very good platform to promote the collaboration 2) this summit does not intend to replace other existing organizations (EPS, AAPPS and others), but it would promote the cooperation, support workshop and meeting, it should be take its place together among the existing organizations.

(TT) many hands are raised, but we have to stop...let us go back home and pass the word to our colleagues and start making a broader interaction, not only country to country but all together. You all have mandate to contribute to the development of ASEPS... thank you for your participation....