Topic 2: Procedures and practices of public education

Introduction

In Topic 2: Procedures and practices of public education, you will be introduced to roles, responsibilities, administrative mechanisms, procedures, learning principles and teaching methods of public education.

Learning Objectives

At the end of the topic you should be able to:

–Identify the general roles and responsibilities of public authorities and other relevant stakeholders that are influencing decisions in national educational systems

–Describe and list administrative procedures and mechanisms to promote public education regarding LMOs through central and subnational/local authorities/governments (top-down approach)

–Describe and list administrative procedures and mechanisms to promote public education regarding LMOs through academia and civil society (bottom-up approach)

–Discuss the importance of mainstreaming biosafety into public education and training

–Identify and describe various learning principles, learning domains and teaching methods, including online and offline methods

Structure

This topic consists of the following lessons:

Topic 2: Procedures and practices of public education

Lesson 1: Roles and responsibilities of public authorities and other stakeholders

Lesson 2: Administrative mechanisms and procedures for public education

Lesson 3: Learning principles and Teaching methods

Topic 2: Procedures and practices of public education

Lesson 1: Roles and responsibilities of public authorities and other stakeholders

This lesson covers the roles and responsibilities of public authorities and other stakeholders that influence decisions in national educational systems. Governments assign these to ensure efficiency and to avoid duplication of work. However, each country is unique (e.g. centralized or decentralized governance) so it is essential to identify the roles and responsibilities of public authorities and other stakeholders in each country to successfully facilitate procedures for biosafety education and enhance intergovernmental relations/coordination of work.

Primary stakeholders

Primary stakeholders are those directly involved in taking decisions regarding the national educational system. They are important as they have the most authority or influence regarding the relevant educational frameworks and policies.

Some of the public authorities and other stakeholders may be:

- *Senior government officials and regulators (e.g. heads of governments, policy-makers, ministers, administrators, politicians, parliamentarians, judicial personnel, governors, mayors, city councils, commissioners, officials, chairpersons, high-level advisory boards):* develop or approve legal frameworks (e.g. Education Acts) and policies for education, such as regarding the accreditation system, qualifications, curricula and other requirements. They also approve and revise educational policies. Parliamentarians also have the authority to audit any financial spending on education.

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Lesson 1: Roles and responsibilities of public authorities and other stakeholders

Specialists and other administrators in departments and agencies (e.g. national focal points, national competent authorities, technical personnel and other specialists such as in the Ministry of Environment, Ministry of Agriculture and Food and/or Ministry of Health): promote biosafety in the national educational system. They usually have the authority and technical expertise to review, prepare, interpret and implement legal frameworks and policies related to education.

Some good practices may include:

- Coordinate and liaise with other stakeholders to promote biosafety education (e.g. relevant public authorities such as in departments and decision-makers, academic institutions, centers and other stakeholders)
- Develop regulations and rules, including education strategies
- Develop procedures on biosafety, including resource guides and training strategies, including training materials
- Develop rules on reporting of progress in education and training actvities
- Report on progress of education and training activities
- Prepare and support implementation of legal frameworks and policies
- Set the national research agenda for biosafety
- Organize and conduct informal education and training (e.g. training-of-trainers programmes, workshops, seminars) including regional and sub-regional trainings
- Integrate biosafety education frameworks into biodiversity and other related frameworks
- Propose financial resources for biosafety education
- Manage communication between international agreements, governments and academic institutions
- Implement administrative functions required by United Nations Conventions and Protocols

- *The Ministry or the Department of Education:* on a national or local level, manage and/or regulate the national educational system to implement the general legal frameworks and policies on public education. They have the authority to develop general mechanisms and procedures for public education, including the quality of educational institutions and the standardization of curricula. They may also approve biosafety to be included in curricula.
- Some general good practices include:
- Support the preparation of educational legal frameworks and policies (e.g. Education Acts)
- Develop guidelines (e.g. for trustees of school boards, academic institutions)
- Manage, provide and approve general financial resources in public education
- Develop and oversee the technical issues, including develop programs and curricula, set requirements for accreditation and certificates, prepare educational materials
- Provide information to academic institutions and scholars/researchers
- Set up training, discussion groups and/or task forces for academia and government officials
- Provide senior advisors in order to promote a certain programme (e.g. environment, gender-equality, indigenous peoples and local communities, translation of materials to local languages, public-private partnerships)

Advisory boards for academic institutions and others (E.g. university committees, school boards, committees or board of education): (on a local level) manage operations of academic institutions in order to ensure implementation on a local level. They assist in determining educational policies.

Some good practices include:

- Determine the technical resources, including the logistics, of academic institutions (e.g. schools) on a local level (e.g. equipment, classroom size)
- Develop, oversee and provide advice on educational programs
- Prepare financial reports (e.g. budgets) and administer financial resources of academic institutions
- Establish and collaborate with educational councils
- Support training of teachers, professors and other educators
- Facilitate meetings to address changes or concerns in academic institutions through members of the school board (e.g. trustees) or councils
- Provide information to academic institutions (e.g. schools and universities), local communities and other stakeholders
- Manage special education in terms of academic institutions in remote places and/or among illiterate communities

Councils for academic institutions (e.g. school councils, university councils): provide advice on the operation and programmes/curricula to academic institutions. As the membership can include educators, researchers, scholars and the public/local communities, it may bring up issues of concerns from local communities or on a local level.

Some good practices include:

- Advice on curricula priorities
- Provide plans on programmes and strategies to improve academic institutions
- Collaboration and links between public authorities and local communities (e.g. partnerships with local and national authorities)
- Set policies on a local level
- Identify and take decisions on educational principles
- Oversee competencies of professors and other educators (e.g. researchers) and their implementation of policies and guidelines

Public curricula development institutions: review curricula, provide recommendations to various stakeholders and develop support for enhanced curricula.

Some good practices include:

- Assess and conduct research on curricula and topics
- Develop learning principles and teaching methods
- Encourage discussions on relevant issues in curricula (e.g. in conferences)
- Provide educational materials
- Independent reviews of curricula
- Promote the use of new technologies (e.g. online modules)
- Provide expertise and advice in curricula development
- Provide content for curricula and training agendas to be used for schools, universities and for professional development training activities in the workplace for staff members

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Secondary stakeholders

Secondary stakeholders are those indirectly involved in taking decisions with regard to the national educational systems. They are important as they influence the decision-making process regarding education by making recommendations and acting as intermediaries in implementing educational frameworks and policies.

Principals, deans, board of governors or other managers of academic institutions: manage academic and/or training institutions in terms of the quality and accreditation. They may provide guidance, oversight and ensure accountability of the national educational system.

Some of the good practices include:

- Manage the budget for the academic institution
- Make financial and technical recommendations (e.g. proposals) and communicate progress (e.g. reports) to school boards and councils
- Maintain technical resources and prepare technical documents to school boards and councils (e.g. proposals and reports) (e.g. expert advice, information, feedback)
- Plan and organize specific public education programmes (e.g. enhance the quality and topics of programmes)
- Coordinate and allocate responsibilities of schools and universities
- Manage different interests, needs, expectations on a local level
- Handle accreditation and admissions and fees
- Handle exchange programmes and other collaborative initiatives
- Determine the educational materials used from approved materials by the Ministry of Education
- Select the teaching methods and learning principles for the academic institutions

Professors and other educators (e.g. administrators, community leaders and training facilitators): ensure that programmes and curricula, including educational standards, are met by researchers and other scholars. They are faculty staff or other personnel that deliver the educational and/or training service through instructions during education and training.

Some of the good practices include:

- Prepare curricula and lesson plans
- Facilitate learning, including online or offline learning, in classrooms or other settings (e.g. labs)
- Encourage researchers and other scholars to learn topics and evaluate the programme
- Oversee researchers and other scholars' learning
- Utilize various teaching methods and learning theories
- Advise researchers and other scholars on appropriate programmes and courses
- Assist researchers and other scholars to understand course materials
- Promote monitoring and evaluation of curricula and course materials from researchers and other scholars
- Report on progress in using course materials and curricula to principals and school councils

Researchers, scholars, scholars and other participants in education and training: responsible to research and study course materials in line with a curricula/programme and produce research and or other materials for course work or the public. They are formally enrolled in education or engaged in learning through training activities. They may also provide further education and research or professional contributions to government officials, academia and or the general public.

Some good practices include:

- Prepare for research and studies for a specific course
- Becoming familiar with course materials
- Provide peer-reviews
- Joining students' associations or committees
- Joining alumni on special programme areas/courses
- Join discussions on biosafety
- Develop abstracts, papers and/or articles to be approved by media or editors
- Participate in lectures and conferences
- Seek funding for research projects, scholarships and/or fellowships in specific topics/courses
- Become an honor society member through grade point averages and/or approval by peers in certain topics and/or programmes
- Follow research policy from publishing and media organizations
- Undertake systematic research to improve general information to the public to establish or confirm facts or develop new theories, including testing the validity of instruments, procedures, or experiments

Tertiary stakeholders

Tertiary stakeholders are those that are not directly involved in taking decisions regarding the educational system but facilitate the process of decisions through providing advice. They are important as they indirectly influence decisions through evaluating and monitoring education and training. They may then make recommendations to the primary and/or secondary stakeholders.

Publishers of educational materials: review, print and make available materials in line with policies, guidelines and curricula on various topics.

Some good practices include:

- Promote awareness and education of published educational materials to various stakeholders (e.g. meetings, social media)
- Develop councils of specialists (e.g. environment, science)
- Provide independent expert advice on text to be published (e.g. editors, peer-reviews)
- Assign anonymous evaluators to check text (e.g. referees, reviewers)
- Publish educational materials (e.g. articles, journals), ensure consistency/educational policies of education materials implemented
- Provide guidelines on national educational policies for authors (e.g. government officials, academia) for preparing and submitting manuscripts (e.g. confidential information, handling misleading information, copyright materials, integrity, providing appeals for rejected text/manuscripts)
- Set up editorial and publishing policies
- Provide up-to-date information to the public and other stakeholders of editorial and publishing policies in various sources
- Avoid “dual use research” that may harm research and publishing of educational materials
- Joint editorial boards and other networks

Professional organizations of educators (e.g. associations, honor societies, networks and other bodies): provide review and evaluation of curricula, training and promotion of programmes and courses.

Good practices include:

- A large membership of professors and other educators that discuss curricula and standards
- Provide updates regarding public education
- Provide educators with teaching and learning methods and tools (e.g. new technologies)
- Provide proposals on new topics and courses
- Promote education of different topics to indigenous peoples and local communities
- Provide scholarships and fellowships for researchers
- Develop resource guides, training strategies and other plans
- Provide training on specific topics
- Encourage educators to participate in government meetings
- Provide educational materials from donations and other sources to libraries
- Support education to illiterate groups

Independent review bodies (e.g. public agencies or organizations): keep oversight and assess the implementation of standards and recommend issues of concern or new methods to improve programmes. They do so with the authorization of educational public authorities.

Some good practices include:

- Develop and issue tests to evaluate the achievement of curricula and standards
- Evaluate and measure the quality and effectiveness of educational systems
- Report on test results to the Ministry of Education and to the public
- Provide recommendations to improve test results
- Assess that educators align with curricula
- Evaluate researchers and other scholars' achievements and long-term outputs to common standard
- Provide feedback to researchers and other scholars on assessments
- Report and provide interactive discussions with academic institutions
- Build capacity through training and updating information on progress in curricula development and standards and research programmes
- Facilitate participation in international assessments
- Inspect academic institutions on a regular basis

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International, regional, national and local organizations as well as other interest groups (e.g. centers, institutes, civil society, consumer groups, educational centers, libraries, farmers' associations, women's groups, indigenous peoples and local community groups and youth groups): facilitate informal education and training. They may be able to educate and train members of the public that were not able to undertake formal education and training. They may provide training, including certificates, to government officials. They may also be the link between public authorities and local communities in educating the public.

General mass media (e.g. Internet, print, broadcast media, including radio and/or television, including journals): facilitate education and training as a channel of communication or develop independent educational materials to make available to the public. They can quickly facilitate public education, including, in some cases, in different local languages. They can be the intermediaries between public authorities, academia and the public.

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Lesson 3. Administrative mechanisms and procedures for public education

Introduction

Reviewing the relevant public authorities and other stakeholders from the previous lesson will assist in facilitating administrative mechanisms and procedures based on national legal frameworks and policies for biosafety education. Governments select mechanisms and set up procedures to, among other things, address limited financial resources, coordination among stakeholders, and/or political will to promote topics. The mechanisms and procedures are key in order to plan, implement and evaluate strategies to promote biosafety education.

There are two basic approaches that facilitate mechanisms:

1. A top-down – or 'push' – approach to set up a mechanism to collaborate with public authorities to promote, in particular, formal education
2. A bottom-up – or 'pull' – approach to set up a mechanism to collaborate with academic institutions, civil society and other related stakeholders to promote both formal and informal education

Ministries, including the Ministry of Education, often combine the top-down and bottom-up approach to select the mechanisms to enhance human, technical and financial capacity to promote biosafety education.

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A top-down mechanism

The purpose of selecting a top-down mechanism is to collaborate with public authorities in order for educational institutions and other educators to efficiently provide education on biosafety and use the relevant educational materials.

Planning phase – Build and maintain joint activities

The planning phase would entail building and maintaining joint activates to establish institutional mechanisms to promote and facilitate public education concerning LMOs. In order to do so, governments need to identify the gaps, challenges and good practices.

Some general good practices include:

- Identify the public authorities that have the key roles and responsibilities
- Identify if the public authorities have sufficient financial resources
- Identify if there is sufficient administrative and logistics/technical capacities
- Identify the relevant human resources of the different public authorities and their capacity
- Establish baseline data on the current situation with regards to education and training related to biosafety
- Identify existing governmental programs of general issues
- Identify means of communication, formal and informal communication
- Establish a list of potential academic institutions and other educators that may want to offer biosafety education, including biodiversity, environmental, sustainable development educators
- Establish a list of public authorities that have direct influence in decisions regarding public education. This depends on the level of governance to which the country takes decisions on education - on a federal/national or state/local-level
- Identify national procedures to integrate topics into public education.
- List meetings, events and/or projects (e.g. from reports, inputs or websites) by public authorities that take decisions on education to present subject/consult/cooperate with them

Resource: Approaches to decision-making in government (e.g. rational vs. incremental approach), features of leadership styles of public authorities leaderships, decision-making processes to provide regulations and public administration in a time of

Planning phase – Build and maintain activities

In the planning phase, the priority should be to build and maintain activities. There are two main procedures to consider to enhance the cooperation with public authorities to promote public education. These are:

•Organize awareness and educational activities

•Participate in international, regional and national events related to strategic planning in biosafety, the Convention on Biodiversity and the Food and Agriculture Organization to integrate the Programme of Work in other initiatives

1) Organize awareness and educational activities

There is need to organize and joint awareness and educational activates to make public authorities that are decision-makers regarding education understand the importance of promoting public biosafety education. In doing so there are a few steps to consider, including:

•**Nominate or suggest experts in education and/or training in biosafety.** Ministries should identify and nominate national biosafety education experts to promote biosafety education. When doing so, they should also make them available in the roster of experts in the Biosafety Clearing-House. The experts would play a significant role in facilitating collaboration to promote public education.

•**Appoint or identify individuals and/or a group(s) that can assist in providing information to relevant public authorities**

•**Encourage public authorities to set up biosafety units, advisory groups and other initiatives** (e.g. the Ministry of Education to set up a up a biosafety education unit in the Curriculum Development Department)

•**Identify relevant roles and responsibilities of public authorities** (e.g. decision-makers, curricula developers in Ministry of Education)

•**Learn negotiation, intergovernmental relations and communication skills**

•**Organize general awareness and educational initiatives.** The initiatives could include training programmes, workshops, conferences, seminars, campaigns, discussion groups, networks or public meetings.

•**Encourage governments to support existing and new national, subregional and regional initiatives in biosafety training and education, including mobility support.** Focal points and other administrators would need to highlight the initiatives and the need for support in building the capacity to maintain the initiatives. One of the key initiatives to highlight would be to promote the accreditation of exchange students and other scholars in taking a programme or course on biosafety

Resources: Top negotiation, intergovernmental relations and communication skills

•**Collaborating with international, sub-regional and regional organizations to organize awareness and education activities.** There are a number of initializes that can assist in promoting biosafety education and training.

Some of the good practices include:

-Develop an international biosafety fund for exchange of experts, scholarships and establish standardized curricula for biosafety courses or biosafety to be integrated in courses
- Develop academic exchange and fellowship programs to facilitate the sharing of expertise, including through North-South and South-South cooperation
- Facilitate a dialogue between educational centers involved in biosafety training and education through a global network
- Promote collaboration with relevant international agreements and processes involved in public education (e.g. UNESCO)
- Organize regional and international events to promote biosafety education guidance and/or donors to provide funding for mobility support for biosafety experts in training and education
- Encourage universities to collaborate on training and education in biosafety at the regional, subregional and international levels

•**Focal points and other biosafety administrators would need to promote collaboration and dialogue between government and academic institutions and other educators.** Some of the key initiatives could include to promote them joining networks and training activities.

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2) Participate in international, regional and national events related to national strategic plans and other frameworks in biosafety and other initiatives, including biodiversity, agriculture and education

There is a need to participate in international, regional and national events related to national strategic plans and other frameworks in biosafety and other initiatives, including biodiversity, agriculture and education, to make public authorities that are decision-makers regarding education understand the importance of promoting public biosafety education. In doing so there are a few steps to consider, including:

•**Provide information to public authorities on the importance and benefits of education and training of biosafety issues.** The issues to raise could be, among other things, that biosafety is a rising global issue and an important contribution to sustainable development or environment education that needs to be integrated into national education reforms and/or programmes. It is essential to provide incentives to public authorities so that global and national agendas and priorities are interlinked with biosafety issues. Incentives could include the general financial and technical capacities and resources gained in providing biosafety education. Regarding cross-cutting issues in environment-related fields, biosafety could be presented as a benefit in climate change mitigation and adaptation and/or protecting biodiversity.

•**Identify and seize awareness and educational opportunities.** There are numerous opportunities in government to promote public biosafety education. National and local elections are opportune times, when politicians are competing with each others to win arguments on national issues.

•**Join high-level dialogues with the heads of Ministries and Heads of States and Governments.** There is a need to enhance the networking and communication among focal points to the Cartagena Protocol and other relevant biosafety administrators and high-level public authorities. There are also several ministerial discussions, negotiations and other dialogues that provide opportunity to discuss biosafety education.

Resources:

-Ten arguments for biosafety protecting biodiversity and enhancing sustainable development, ten arguments for biosafety contributing to climate change mitigation/adaptation and a calendar of event or initiatives (e.g. celebrations of international day of biodiversity, government programmes to integrate sustainable development/environment in academic institutions or other traing)

-General calendar of /events calendars for public authorities: Ex. http://www.coe.int/t/congress/Calendar/default_en.asp

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After the planning phase of highlighting biosafety education, governments need to set up a system to advance legal and/or policy frameworks and mechanisms to facilitate public education concerning LMOs.

Implementation phase – Advance legal and/or policy frameworks and mechanisms

In the implementation phase the priority should be to advance legal and/or policy frameworks and mechanisms. There are six main procedures to consider to enhance cooperation with public authorities to promote public education. These are:

- Adopt, harmonize and implement legal and/or policy frameworks and mechanisms related to biosafety public education
- Integrate and promote public education of biosafety issues in the National Biodiversity Strategies and Action Plans (NBSAPs) and other national initiatives for capacity-building, public education and strategic planning for biosafety
- Share and announce the availability of frameworks and mechanisms on public education in the Central Portal and national and regional Biosafety Clearing-House nodes
- Integrate gender-perspectives in policies and frameworks related to biosafety public education
- Identify a dedicated budget for biosafety public education
- Every quarter, systematically track, evaluate and actively exchange information on the progress of the indicators in the programme of work in the Biosafety Clearing-House and with the Executive Secretary

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1) Adopt, harmonize and implement legal and/or policy frameworks and mechanisms related to Article 23 of the Protocol, in particular the National Biosafety Frameworks

A procedure should be developed to adopt, harmonize and implement legal and/or policy frameworks and mechanisms related to Article 23 of the Protocol. In doing so there are a few steps to consider, including:

- Review educational legal frameworks (e.g. Education Acts)
- Propose relevant revisions on relevant policies to integrate biosafety and seek approval from the Ministry of Environment and senior officials
- Establish an educational strategy for biosafety
- If possible, develop regulations and rules on biosafety education
- Set up ongoing high-level consultation with government officials
- Set up or participate in networks with relevant educational institutions
- Develop youth guides for academic institutions and youth
- Develop a resource guide for educators, including curricula on different issues under the Cartagena Protocol and seek approval by the Ministry of Education or other relevant public authorities to integrate biosafety into education
- Organize and facilitate relevant training-of-trainers programmes on issues related to the Cartagena Protocol (e.g. seminars, workshops, webinars, e-learning modules) to relevant stakeholders (e.g. the Ministry of Education, researchers, scientist, teachers, biosafety training educators/facilitators)
- Prepare guidelines for Ministry of Education to be used by rlevant stakeholders (e.g. trustees of school and university boards, academic institutions, educators, researchers, task forces and other relevant stakeholder that are part of decision-making)

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2) Integrate and promote public education of biosafety issues in the National Biodiversity Strategies and Action Plans (NBSAPs) and other national initiatives for capacity-building public education and strategic planning for biosafety

A procedure should be developed to integrate and promote public education of biosafety issues in the National Biodiversity Strategies and Action Plans (NBSAPs) and other national initiatives for capacity-building, public education and strategic planning for biosafety. In doing so, there are a few steps to consider, including:

- Participate in NBSAPs initiatives and integrating public education on biosafety in the revised NBSAPs' component on Communication, Education and Public Awareness (CEPA) programme under the Convention on Biodiversity. This will then be part of the planning biodiversity strategies.
- Seek funding for or join capacity-building projects on biosafety to integrate biosafety education with other biosafety capacity-building components (e.g. projects to implement the NBFs)
- Integrate biosafety education in national strategic planning on biosafety
- Align with any biodiversity strategies, including targets
- Describe how biosafety contributes to protecting biodiversity

Resource: Good practices in integrating biosafety into NBSAPs

3) Share and announce the availability of frameworks on public education in the Central Portal and national and regional Biosafety Clearing-House nodes

A procedure should be developed to share and announce the availability of frameworks on public education in the Central Portal and national and regional Biosafety Clearing-House nodes. In doing so, there are a few steps to consider, including:

•Share the legal and policy frameworks on public education on biosafety in the Laws and Regulations database in the BCH (http://bch.cbd.int/database/laws/)

•Actively announce and make available to public authorities the availability of frameworks in the BCH

•Make available research and other information from other stakeholders, including civil society and academic institutions, in the relevant databases in the BCH, including risk assessment reports/studies, academically-accredited biosafety courses/programmes, academic and research institutes, educational materials, public-private partnerships and capacity-building projects

•Actively announce the availability of new records in the BCH related to public education (e.g. newspapers, bulletin boards, public debates, e-list serves)

4) Integrate gender-perspectives in policies and other frameworks related to biosafety public education

A procedure should be developed to integrate gender-perspectives in policies and frameworks related to biosafety public education. In doing so, a few steps could be considered, including:

- Set up indicators to measure gender-perspectives. This would be an important tool to assess the levels of gender equality
- Assign equal number of men and women developing plans for and promoting public education on biosafety
- Integrate public education of women in research and other scholars or learners as a component in strategic planning on biosafety
- Integrate public education of women in research and other scholars or learners as a component in gender strategic plans
- Include equal number of women and men in training-of-trainers programmes
- Highlight issues that are more gender-sensitive related to biosafety to public authorities (e.g. socio-economic issues)

Resource: Gender-perspectives integrated into policies and other frameworks

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5) Identify a dedicated budget for public education of biosafety issues

A procedure should be developed to identify a dedicated budget for public education of biosafety issues. In doing so, there are a few steps to consider include:

- Collaborate and request countries, in particular developed countries, and funding agencies to earmark funding for training and education in biosafety
- Collaborate and request the Global Environment Facility to earmark funding for biosafety training and education
- Develop or integrate a budget plan for public education that considers human, technical and institutional costs
- Review general budget proposals with senior governemnt officers, including parliamenary decisions
- Propose financial resources for biosafety education

Resource: Tips on promoting a grant reform or Financial reform and process of budget making in government, including cost-benefit analysis

Checklist: Questions in calculating a budget

Tips: Seeking funds from GEF

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6) Every quarter, systematically track, evaluate and actively exchange information on the progress in the BCH and with the Secretariat

A procedure should be developed to every quarter systematically track, evaluate and actively exchange information on the progress of promoting public education in the BCH and with the Secretariat. In doing so, there are a few steps to consider including:

- Set up indicators and other rules to measure the status of implementation of legal and policy frameworks of public education in biosafety.
- Review the status of implementation of legal and policy frameworks public education in biosafety
- Use relevant indicators to evaluate how to improve challenges and promote further progress
- Make available challenges and progress of outcomes of indicators and other measures in regional information boards in the Portal on public awareness, education and public participation and in the BCH
- Develop rules on reporting of progress in education and training actvities

Please note that regional infomation boards will be set up also for GRULAC, Western Europe and other States and CEE countries if there is no opposition to creating these.

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The bottom-up approach

The purpose of selecting a bottom-up mechanism is to collaborate with other stakeholders, in particular academic institutions and civil society, in order for educational institutions and other educators to efficiently provide education on biosafety and use the relevant educational materials. Under this mechanism a system is needed to ensure interest from these stakeholders in receiving biosafety education and training and to promote public education in formal as well as informal education.

Planning phase – Advance tools, resources and processes to broaden training activities

The planning phase would entail advancing tools, resources and processes to broaden training activities to establish institutional mechanisms to promote and facilitate public education concerning LMOs. In order to do so, governments need to identify the gaps, challenges and good practices.

There are three procedures:

- Facilitate training-of-trainers programmes, in particular focusing on educators as well as women, indigenous peoples and local communities to ensure that women, indigenous peoples and local communities, and customs officials participate in biosafety education (e.g. participating in academic institutions, workshops and accessing research centers)
- Promote a training strategy for informal education and disseminate a resource guide to academic institutions
- Develop and implement a media strategy to facilitate public awareness and education to journalists and promote them to educate the public about biosafety issues (e.g. print and electronic media)

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Some general good practices include:

- Establish a list of academics involved in training and education of biosafety.
- Review the existing teaching methods and learning theories used
- Review the external and internal factors, including the illiteracy rate
- Undertake training needs assessments to ascertain the demand for biosafety education and training programme and to identify interested target audiences
- Conduct benchmarking studies of youth's understanding of biosafety
- Identify national and local environmental, biodiversity and/or biosafety education initiatives
- Identify relevant civil society, including non-governmental organizations and private sector
- Priorities the stakeholders to work with (e.g. primary, secondary and tertiary stakeholders) in civil society and academic institutions
- Offer a participatory approach in developing strategies for education and training in biosafety
- Promote networks of academic institutions and other educators that provide education or training on biosafety education (e.g. networks for employment in the biosafety field, reports, research and discussions)
- Set up self-evaluation tools and e-learning training for educators and scholars (e.g. e-learning module for customs officers)

1) Facilitate training-of-trainers programmes, in particular focusing on educators as well as women, indigenous peoples and local communities to ensure that women, indigenous peoples and local communities, and customs officials participate in biosafety education (e.g. participating in academic institutions, workshops and accessing research centers)

A procedure should be developed to facilitate training-of-trainers programmes, in particular focusing on educators as well as women, indigenous peoples and local communities to ensure that women, indigenous peoples and local communities, as well as customs officials, participate in biosafety education (e.g. participating in academic institutions, workshops and accessing research centers). In doing so, there are a few steps to consider:

- Conduct and analyze surveys to relevant stakeholders, including educators and civil society
- Organize and invite relevant organizations and institutions, including for educators and women, indigenous peoples and local communities, to training-or-trainers programmes and biosafety events (e.g. conferences/workshops with biosafety experts/researchers)
- Invite civil society to participate in meetings, e-learning modules and review educational materials
- Offer libraries and educational centers (e.g. Aarhus Convention centers) relevant biosafety materials and collaborate in facilitating training in these places
- Set up networks for biosafety educators, women, indigenous peoples and local communities
- Facility or encourage petitions of stakeholders to collect names of those interested in biosafety education and to promote the importance of biosafety information to public authorities
- Train youth groups in local communities biosafety education and training
- Develop biosafety leadership programs and other incentives for women, youth groups, community leaders other relevant stakeholders for them to continue to facilitate education and training in biosafety
- Foster formal and informal partnership agreements on collaboration
- Establish coordination mechanisms or networks for educators to share information
- Encourage fellowship and exchange programmes, including South-south and North-south cooperation

Resources: Tips for petitions , tips in facilitating networks, awareness survey template
For more comprehensive information on Gender and Biosafety:
https://portals.iucn.org/union/sites/union/files/doc/gender_and_biosafety.pdf

2) Promote training strategy for informal education and disseminate a resource guide to academic institutions

A procedure should be developed to promote a training strategy for informal education and disseminate a resource guide to academic institutions. In doing so, there are a few steps to consider including, to:

- **Collaborate with relevant stakeholders.** This would be in partnership to develop strategies and guides (e.g. advisory boards, academic councils, public curricula development instititions, managers of academic institutions, researchers, educators, civil society, organizations, interest groups and others).
- **Develop and promote training strategy.** This would include, among other things, a needs assessment and an ongoing platform to discuss biosafety education and training for civil society and academic institutions.
- **Promote a resource guide (e.g. training package or toolkit) to educators.** This would include, among other things, providing incentives (e.g. rewards, competitions, financial support, employment, research opportunities) for educators and other stakeholders holding biosafety education or training or learning about biosafety.
- **Collorate with publishers of educational materials.** This would faciliate opportunities for resource guides to be published and other relevant information.

Topic 2: Procedures and practices of public education

Lesson 3. Administrative procedures and mechanisms for public education

3) Develop a media strategy to facilitate public education to journalists and promote them to educate the public about biosafety issues (print and electronic media)

A procedure for media relations will also have to be set up. This media strategy may, among other things, include:

- Encourage both print and electronic media to promote public education. This could be through educational reportages, interviews and TV and radio shows.
-Encourage media to develop and disseminate regular educational materials
-Develop and disseminate educational materials for media (e.g. newsletters)
-Invite media to participate in biosafety events
-Encourage them to share experiences in the Biosafety Media Network in the BCH: http://bch.cbd.int/onlineconferences/portal_art23/media_network.shtml
-Encourage media to interview biosafety experts and to hold TV and radio shows
-Promote media to publish relevant articles and research on biosafety

Implementation phase – Strengthen biosafety education at all levels

The implementation phase would entail strengthening biosafety education at all levels. In order to do so, governments should develop a system to ensure that academic institutions and other educators provide biosafety education and training.

There are two procedures:

•Promote relevant learning principles and teaching methods for biosafety
•Ensure that biosafety education is promoted by relevant stakeholders, including educators

1)Promoting relevant learning principles and teaching methods for biosafety

A few learning principles and teaching methods include:
•Three learning domains that will be discussed in the next lesson
•The teaching methods will also be discussed in the next lesson

2) Ensure that biosafety education is promoted by relevant stakeholders, including educators

A few indicators to ensure that biosafety is prompted by educations include:
•Number of academic institutions with biosafety courses and/or programmes in particular in secondary and higher education
•Number of academic institutions and academics providing access to risk assessment documentation
•Number of educational networks discussing biosafety issues
•Number of existing biosafety institutions receiving accreditation
•Number of open-source course materials and teaching tools available
•Number of international, regional and national educators with a section/unit on biosafety
•Number of academic experts in biosafety
•Number of activities recorded in the BCH by academic institutions on biosafety education and training

Also, it may be useful to establish a survey to be issued before and after the initative of a bottom-up approach

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Importance of mainstreaming and integrating biosafety into biodiversity and other related environmental education at all levels

Topic 2: Procedures and practices of public education

Lesson 1: Learning principles and teaching methods

Learning principles:

Learning principles are learning theories and modes used in education and training in the process of enhancing the understanding of information. Governments may decide on the learning theories and modes in the national educational system for formal education. In informal education, the decision is made by the organizer or educator of the education or training. The theories and modes are important to use to improve understanding of information.

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Lesson 1: Learning theories and teaching methods

The three major learning principles involve:

Behaviourist/Hierarchical principle: is learning through situations, meaning that learning depends on the environment. Learning occurs when educators provide new ideas that may be reinforced and repeated. It is based on motivations in education and training, including learning reinforced positively (e.g. verbal demonstrations, good grades, awards, bonus points or any other benefits). Educators also make all the decisions and interprete how scholars or other learners understand information.

Cognitivive/Cooperative principle: is learning through multiple intelligence, meaning that learning depends on the learner. Learning occurs as a mental process, based on how information is received and processed. It is based on internal processing of information and how to relate information to scholars (e.g. analogies, problem-solving, inferences, developing own information and materials). Educators promote active participation and evaluates learning through how responsibility scholars or other learners are in the education and training activities.

Constructive/Authonomous principle: is learning through, experiential learning, meaning that learning depends on past skills and understanding of information. Learning occurs when information is interpreted based on past experiences and ideas. It is based on a tailored process of constructing information so that educators merely assist in understanding the information. Scholars can develop their own concepts and mental models, and adjust them to form new ideas. Educators allows for scholars and other learners decisions how and what to learn, including to come up with their own conclusions that are influenced by their background.

Topic 2: Procedures and practices of public education

Lesson 1: Learning theories and teaching methods

Learning domains

Learning domains describe the learning principles in practice. They are useful in developing learning objectives of a curricula.

The main learning domains include:

Cognitive learning involves development of intellectual skills. Learning objectives promote processing and reasoning information. These include: problem-solving skills, memory retention and the perception of learned material.

Psychomotor learning involves development of physical skills, motion-skills. Learning objectives promote coordination and physical movement. These include: the development of the skills in terms of speed, precision and techniques.

Affective learning involves the manner of developing emotions. Learning is achieved by promoting feelings and reactions. These include: values, appreciation, motivation, enthusiasm and attitudes.

3 Scenarios of using learning theories and domains, including how a person (e.g. scholar, participant of a training activity) on biosafety understood information provided by an educator and how this was evaluated

Source: Bloom's Taxonomoy

Other learning factors

There are also other learning factors that are important to understand when developing and facilitate educational and training activities.

- Age groups: the peak of learning is between 20-30 years old
- Learning curve: increase of learning with experience
- Motivation: goal-oriented and reward-oriented learning may motivate scholars and other learners
- Learning styles: activists prefer learning from doing (e.g. participative exercises and real experiences), reflectors need time to learn to draw out learning from their experiences, theorists like to explore theories and concepts without putting much into practice (e.g. reviews quality of the ideas and concepts), pragmatists learns form new methods
- Kolb's categories of learning styles: a cycle of experiential learning that applies to us all

http://www.businessballs.com/images/kolb's_learning_styles_businessballs.jpg

- Intuitive model of learning: Outcomes of learning is based on the teaching methods

https://upload.wikimedia.org/wikipedia/commons/3/3d/Edgar_Dale%27s_cone_of_learning.png

- Group dynamics: stages in group dynamics explains the teams development and behaviour during education and training

http://www.businessballs.com/images/forming.jpg

Scenarios: Insight of scholars and other learners affected by other learning factors when being educated or trained in biosafety – Ex. groups interacting, reaction of learners based on Dale's cone, providing motivational items to make people learn

Lesson 1: Learning theories and teaching methods

Teaching methods are procedures used in education and training. Academic and training institutions may decide on the teaching methods. These methods are important to use in promoting an efficient understanding of a topic. They should be aligned with context and circumstance. They are also based on designing and developing instructions to improve learning and quality in education and training.

Offline methods

Teaching methods

Offline methods are based on face-to-face methods of educating and teaching people. They are mostly used for formal education. However, they are not always teacher-oriented or educator-oriented methods. They are also used for project-oriented or field-oriented teaching. These are useful for topics that are introductory courses. The benefits are immediate feedback and and increased group interactivity and teamwork.

Some good practices in offline teaching methods include:

•Debates/Discussions/Panels: Discussions of issues and ideas that receive immediate responses
•Case method/Design thinking: Reviews, discussions and decisions based on case studies and real-life events
•Demonstrations: Practical methods are used to teach scholars (e.g laboratory practice)
•Field trips and outdoor education: Visit to a place to study information firsthand and gain practice skills
•Jigsaws: Groups are assigned to different tasks and then share the results of the task
•Interactive lectures: Educators break the lecture at least once for practical application of the information provided;
•“Drill and practice” instruction: information is taught through repetitive practices for scholars learning a new topic;
•Metaphor teaching: Pairs abstract content with images or concrete situations
•Narratives or story-telling: Written or oral stories improvised, or structures with a plot, characters and conclusion
•Mock conventions and role-playing: Taking up a role of a character to discuss issues (e.g. in games)
•Think-pair-share: Timeframes are given to scholars to formulate individual ideas, the ideas are then discussed with peers to draw any further conclusions
•Writing-to-learn assignment: Written exercises to demonstrate and build understanding of topics
•Teaching day and weeks of the year: Highlights and/or engages students on a topic during an international or national celebration or event (International Day of Biodiversity)
•Project-based teaching: assignments are provided for practical methods to solve problems and understand issues usually by working in teams (e.g. explorations, inquiries)

Topic 2: Procedures and practices of public education

Lesson 1: Learning theories and teaching methods

Online methods:

Online methods are based on using the Internet for educating and training people. These tend to be used in informal education. They also provide an easier platform to learn through self-paced training. They usually allow for more repetitive training exercises to understanding information. These are also useful for continuing education and, at times, to provide additional information apart from the curricula items.

Some of the good practices include:

E-Learning modules and courses: Computer-delivered education through interactive materials and are self-paced;

Digital dialog: Sites offered by academic institutions to have discussions on projects and assessment provided by social media portals;

Social Media: Internet platforms to allow for education and training to a larger public through exchanging information (e.g. edConnectr, TedEd, Vimeo, Edmodo, WordPress, Blogger, Skype, Instagram, YouTube, Twitter, Pinterest, LinkedIn);

Webinars: Online real-time conferences that allow for the interaction and discussion between participants and interaction with a specialist;

Webcasts: Live streaming or broadcasting online of an audiovisual or other educational presentation.

3 scenarios: Benefits of using online, offline or blended methods of teaching– educator and scholar experience conversation on biosafety

Resource: Social media guide