

Capacity Building in Plant Breeding

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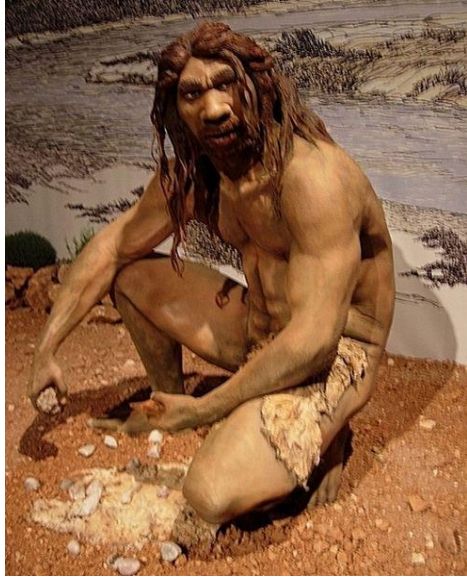
Capacity Building:

1. Capacity Building is defined as the process of developing and strengthening the **skills, instincts, abilities, processes and resources** that organizations and communities need **to survive, adapt, and thrive in a fast-changing world.**
2. An essential ingredient in capacity-building is **transformation that is generated and sustained** over time **from within.**
3. The United Nations Sustainable Development Goal 17 includes targets for capacity-building, including increasing technology and innovation.

Capacity Building in Plant Breeding:

- o **Plant Breeding has been an integral part of human life and evolution**
- o **Early human beings, by selectively propagating and growing plants and rearing animals of their choice, have, intentionally or otherwise,**
 - o **Changed the genomes of virtually every plant and animal.**
 - o **Human beings are, in fact, Plant & Animal Breeders, from the day they became settlers.**
- o **Plant Breeding, now, is more an institutionalized activity, in both public and private sectors**
- o **Capacity Building in Plant Breeding, in effect, refers to Institutional Capacity Building efforts**

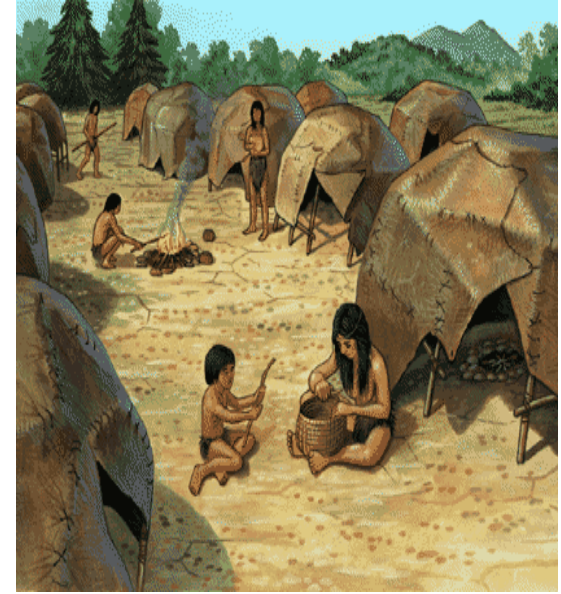
HISTORY OF THE HUMAN RACE



Hunter-Gatherer >> Settler



Conventional Agriculture



Genetic Modification Through the Ages



Capacity Building in Plant Breeding – Who is doing what:

- 1. GIPB – Global Initiative in Plant Breeding, FAO**
- 2. APSA – Asia Pacific Seed Association**
- 3. Baenziger, et. al., 2009 – Review**
- 4. ATPBR – Foundation for Advanced Training of Plant Breeders**

Several other organizations are involved in this endeavour:

- 1. Wageningen Univ, NL**
- 2. Plant Breeding Academy, UC Davis, California**
- 3. Sathguru Management Consultants Pvt Ltd, Hyderabad**
- 4. MANAGE, Hyderabad**
- 5. Etc.,**

GIPB - Capacity Building Initiatives - FAO

- **GIPB = Global Partnership Initiative for Plant Breeding**
- **Aims of GIPB:**
 - **To improve institutional capacity for effective crop variety development.**
 - **To improve their distribution through seed systems.**
 - **Catalyzing and supporting national, regional and global action among relevant international organizations, foundations, universities and research institutes, corporate and business sector, civil society associations, and national and regional bodies.**
- **GIPB was launched in June 2006.**
- **Acts as an information clearing house for sustainable use of plant genetic resource.**

GIPB - Capacity Building Initiatives

- **At the global level, GIPB promotes**
 - **Analysis and information about plant breeding training programs;**
 - **Availability of genetic resources of various types; molecular and non-molecular technologies; methods and know-how; laboratory facilities and bioinformatics, and**
 - **Enables the matching of needs with service providers.**
- **At the regional level, GIPB promotes**
 - **Regional coordination by supporting opportunities for training,**
 - **Sharing of genetic material technologies and**
 - **Assistance in formulation of country strategies on plant breeding, related biotechnology and seed systems.**
- **At the national level, GIPB supports**
 - **the formulation and implementation of national strategies (including policy advice) on plant breeding capacity which lead to a plan of action in enhancing awareness,**
 - **promoting policy planning and developing human resources and institutional capacities in support of plant breeding programs.**

GIPB - Capacity Building Initiatives

Objectives of GIPB :

- **Policy development** : Help governments develop national genetic resources and plant breeding strategies compatible with country needs, and supports the formulation of plant breeding capacity assessments
- **Education and training** : Supports the capacity development in pre-breeding and biotechnologies by providing links to courses and training providers, training events and workshops and online training material.
- **Access to technologies** : Promotes new information and knowledge processes and accelerates the provision of technologies in the form of tools, methodologies, know-how and facilities to finding genetic solutions to crop productivity constraints in developing countries.
- **Access to plant genetic resources** : Supports collective action towards adding value to germplasm by fostering efforts of characterization and evaluation of national and international collections
- **Sharing of knowledge and information** : Established a plant breeders' directory as part of ongoing efforts to foster a global network of scientists, policy makers and other stakeholders engaged in the conservation, utilization and dissemination of plant genetic resources for food and agriculture (PGRFA)

APSA – Capacity Building Activities

- **About APSA (Asia Pacific Seed Association) :**
 - **APSA is a Regional Association of over 450 seed companies**
 - **Over 52 countries from in and outside Asia Pacific region members of APSA**
 - **APSA's mission is sustainable agriculture through production and trading of quality seed globally**
- **Objectives of APSA:**
 - **Strengthen capacity of human resources in agriculture**
 - **Knowledge enhancement and capacity building**
- **Programs on Capacity Building:**
 - **Initiated learning programs to develop skills and knowledge**
 - **Focussed topics are Plant Breeding and Seed Technology**
 - **Created – Train the Trainer Program, University Connect Program, Webinar Series**
- **APSA's survey of training needs in Plant Breeding and Seed Technology**

Baenziger, P.S., P.W. Simon, and T.C. Wehner. 2009. “Educating the next generation plant breeders: The Need and The Challenge”.

(https://www.researchgate.net/publication/228959012_Educating_the_next_generation_of_plant_breeders_the_need_and_the_challenge)

- **Technology of plant breeding is changing, so established plant breeders need to upgrade their skills constantly – leads to two key questions:**
 - **Is there enough capacity to educate the number of plant breeders needed in future?**
 - **Do we have the approaches to continue to educate modern plant breeders in changing times?**
- **As per Baenziger (2009), answers to the above questions, globally, is NO**
- **However, both questions are being asked by Companies, Government & Non-government agencies, Universities, and Individuals – hope a consensus emerges**
- **Therefore, as the science of plant breeding changes, so should be the educational approaches in plant breeding**
- **The approaches should include:**
 - **Internships at major companies and International centres**
 - **Establishment of virtual and single location educational centres**
 - **Systematic life-long learning**
 - **A fluid workforce which moves globally and from private to public sector seamlessly**
- **The education system should prepare students for positions that simply do not exist today.**

Capacity Building in Plant Breeding by ATPBR

Focus of ATPBR:

- **Nurture young plant breeders through upgradation in use of cutting-edge technologies, via a network of experienced plant breeders**
- **Promote partnerships for capacity Building**
- **Aspire to become a Capacity Building Platform in Plant Breeding**
- **Act as a bridge between Plant Breeding academia and Plant Breeders in private and public sector organizations**
- **Connect successful and experienced Plant Breeders to potential and practicing Plant Breeders to harness the former's wisdom and Plant Breeding skills for the benefit of next generation Plant Breeders**

Capacity Building in Plant Breeding by ATPBR (Contd)

Activities of ATPBR 2018-2023:

- **Training Courses**
 - 24 courses organized
 - 478 participants
 - 66 faculty members
- **Conferences**
 - 4 Annual 5F Conferences organized + 1 Global GORT Conference
 - 980 participants
- **Collaborative Programs**
 - 2 – University, Regional Seed Association
- **Publications**
 - 2 – Books on Plant Breeding
- **Webinars**
 - 25 monthly webinars with 7000+ participants
- **Mentorship**
- **Bridge Courses**
- **Associated Programs**
- **Sponsored Programs**

Thank You