



BKJ



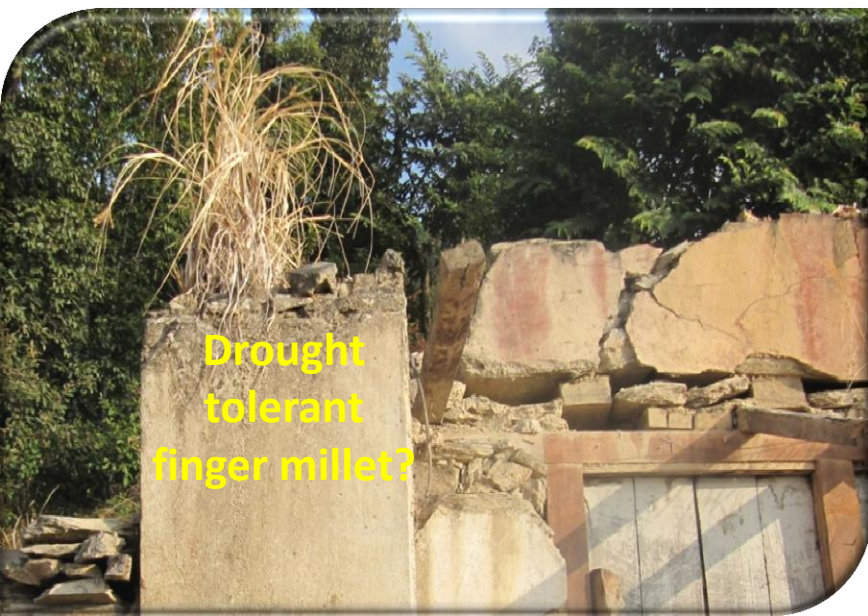
Genebank, Nepal



3rd Breeders Meet

Plant geneticists and breeders for advancing agricultural science, and food and nutrition security in the country

27 Dec 2017 (12 Paush 2074)
SSD, NARC, Khumaltar



Drought
tolerant
finger millet?

Plant Genetics and
Breeding Society of
Nepal

PGaBSon

पिगाबसन





BKJ



Genebank, Nepal



3rd Breeders Meet, 27 Dec 2017, SSD, NARC, Khumaltar

Plant Breeding History in Nepal: 67 years old



Bal Krishna Joshi
National Genebank,
NARC, Khumaltar

joshibalak@yahoo.com



BKJ



Genebank, Nepal



This presentation is dedicated to

Netra B. Basnyat

Gopal R. Rajbhandary

Amresh M. Pradhananga



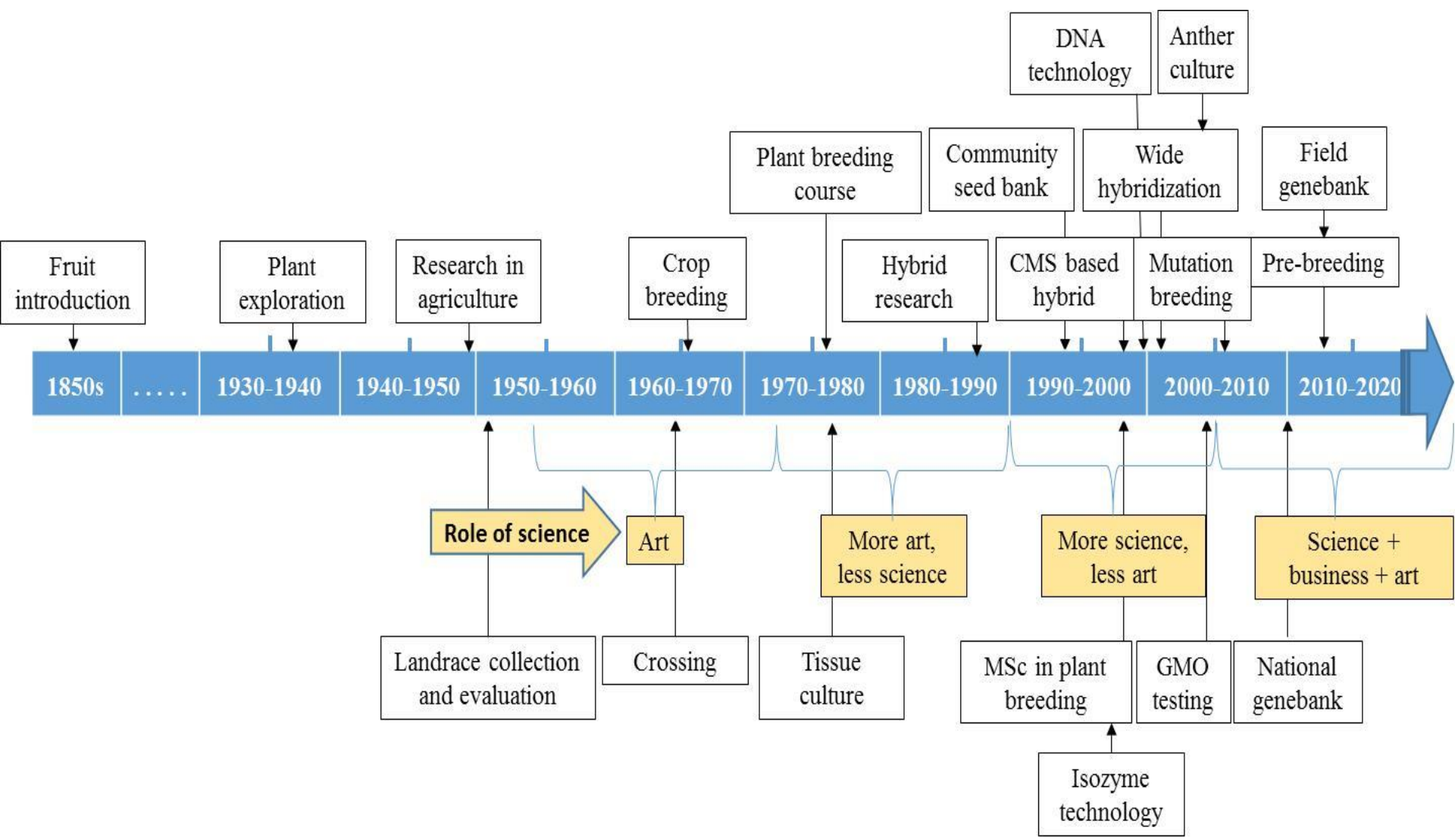
BKJ



Genebank, Nepal



Major Historical Events of Plant Breeding in Nepal





BKJ



Genebank, Nepal

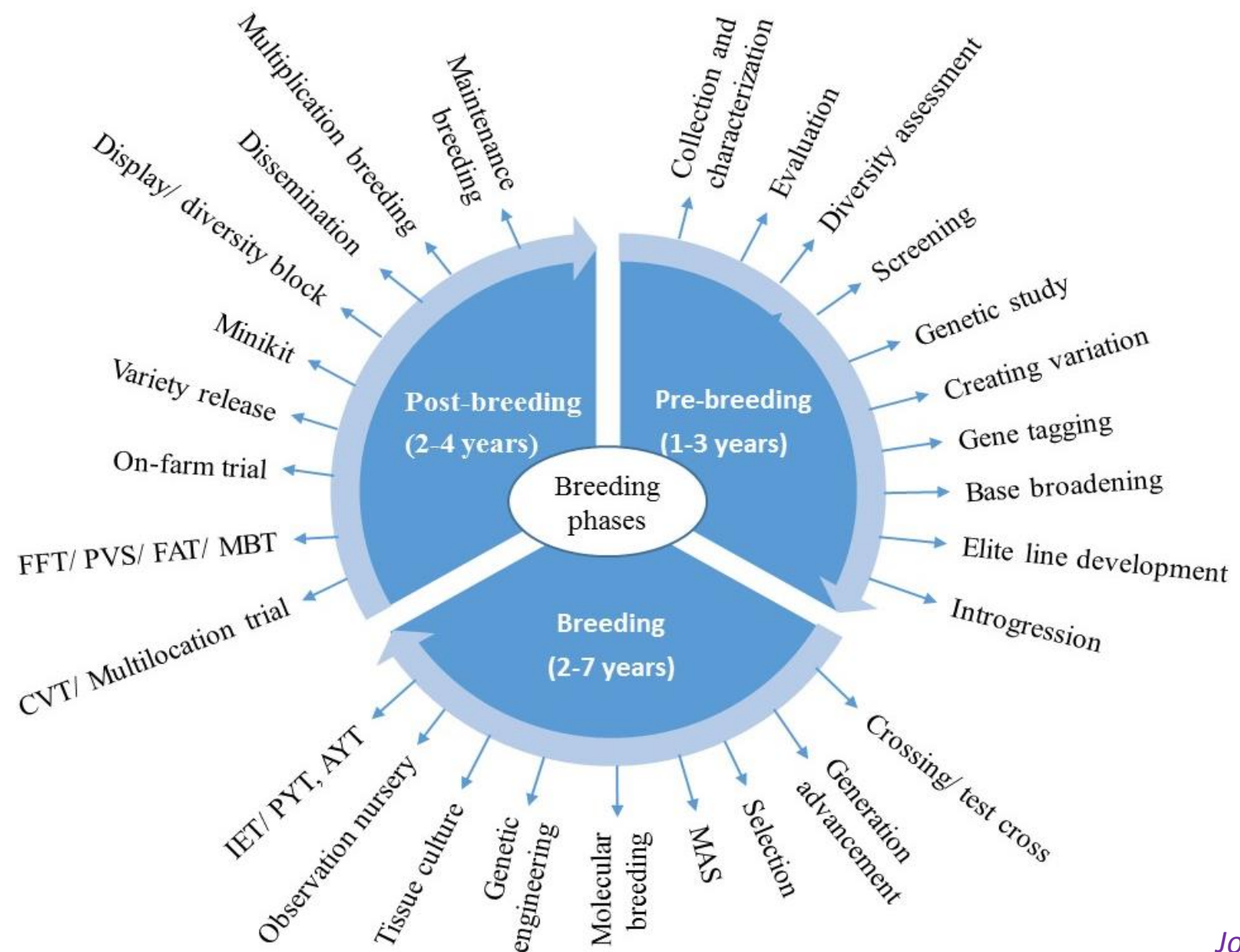


What History we have in Plant Breeding

- Plant breeding works: Since 1951 in Agronomy Farm, Kathmandu
- First breeder: Netra B. Basnyat
- First recommended variety: CH-45 rice in 1959
- First hybridization in 1964: By Gopal R. Rajbhandary in potato
- Main breeding methods: Introduction, pedigree, composite
- 35 different landraces (0.1%) of 17 crops used to develop 39 varieties
- Crop species in breeding: 13% (484 species)
- Dependency: 95-100% on foreign APGRs

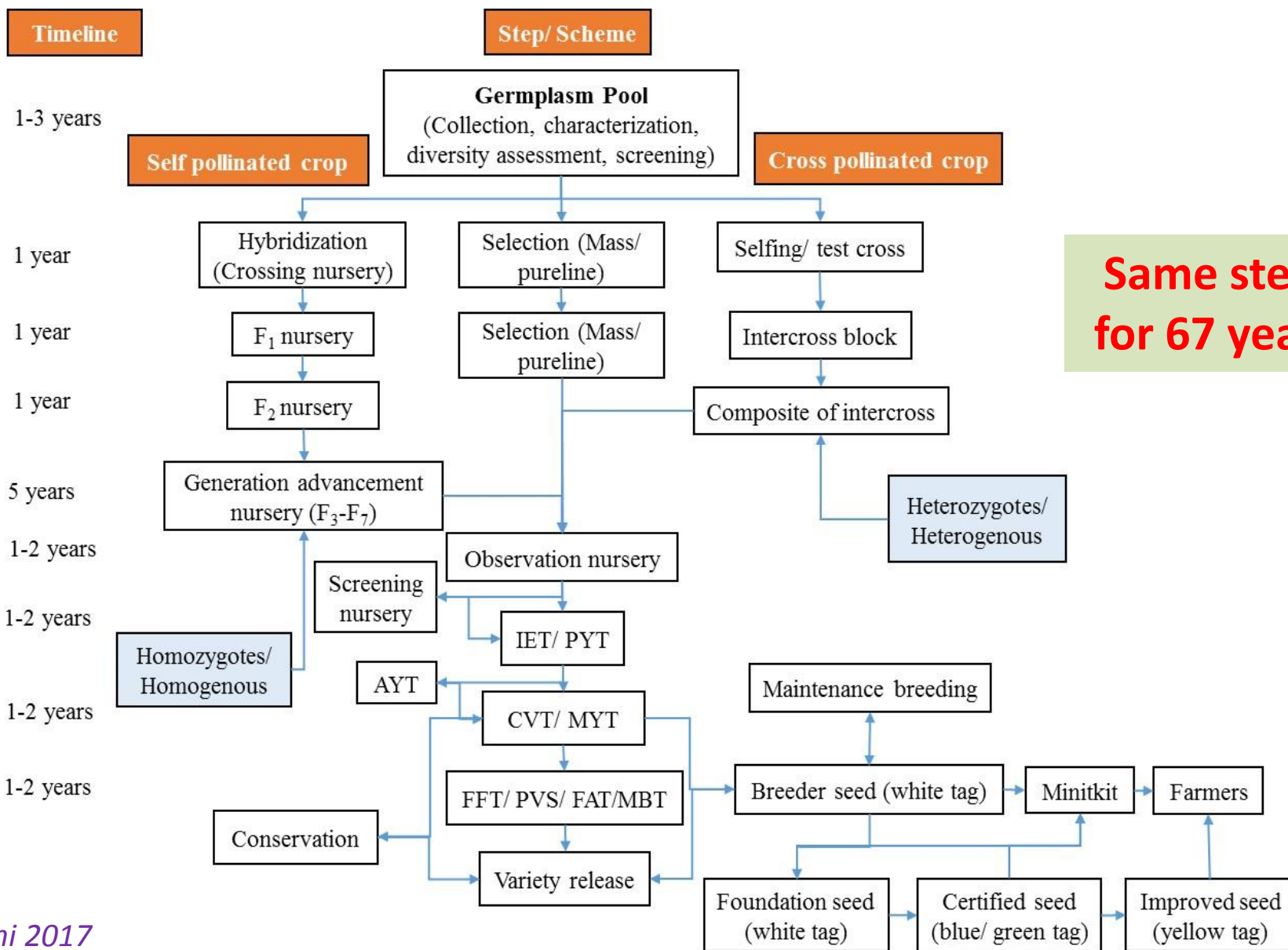


Plant Breeding Phases and Activities in each Phase





Generalized Plant Breeding Scheme for Self and Cross Pollinated Crops in Nepal





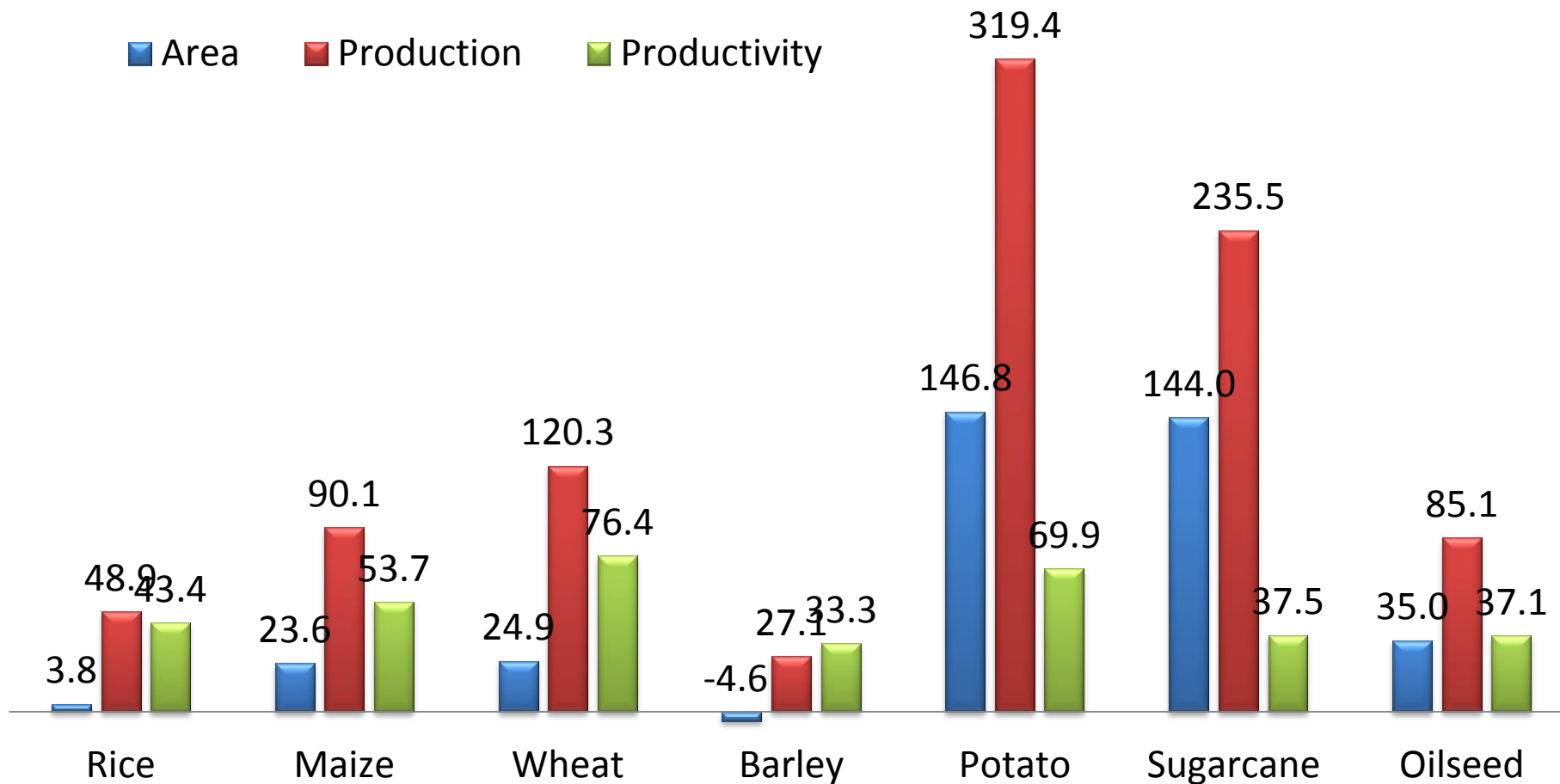
BKJ



Genebank, Nepal



% Increment in Area, Production and Productivity over 25 years (1990-2014) in Nepal





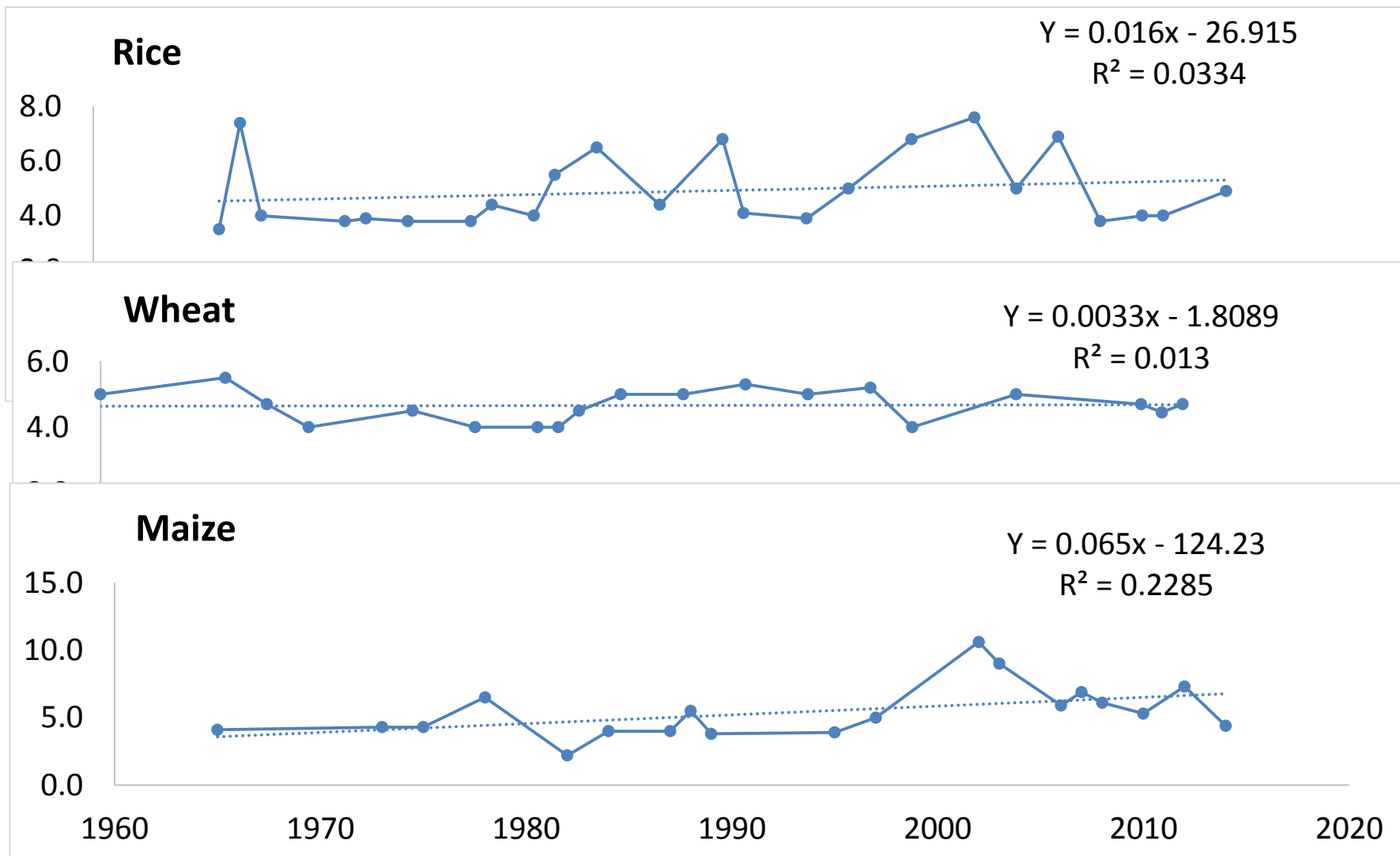
BKJ



Genebank, Nepal



Yield potential of released varieties over the years (1960 to 2015 in X-axis and yield, t/ha in Y-axis)





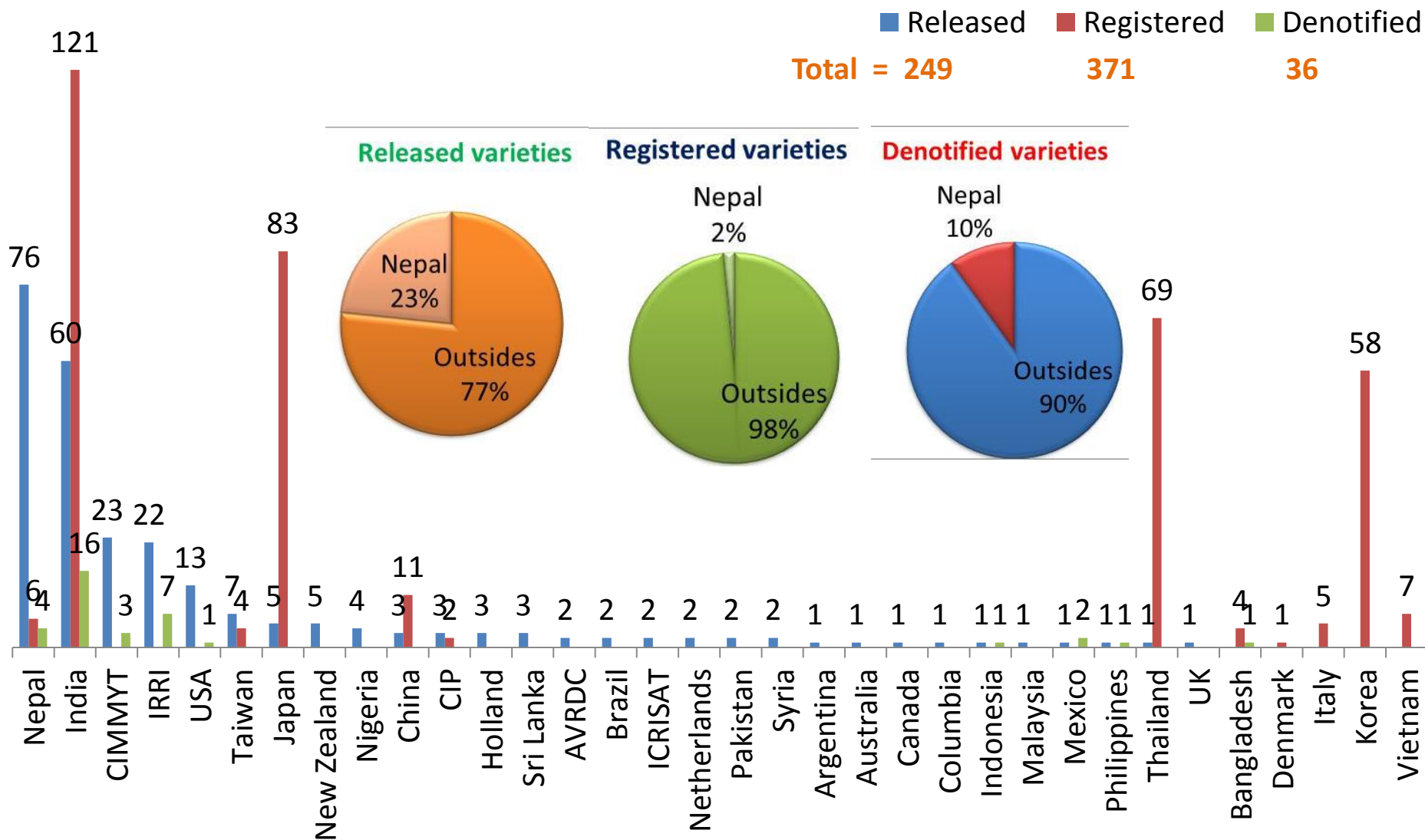
BKJ



Genebank, Nepal



Origin of Crop Varieties





BKJ

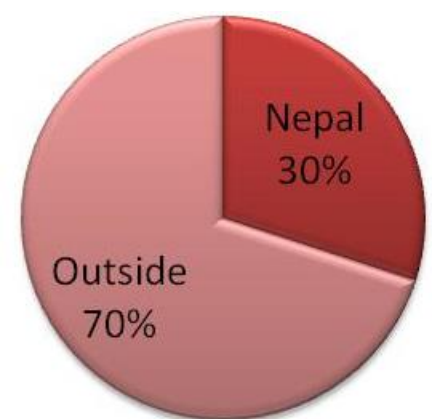
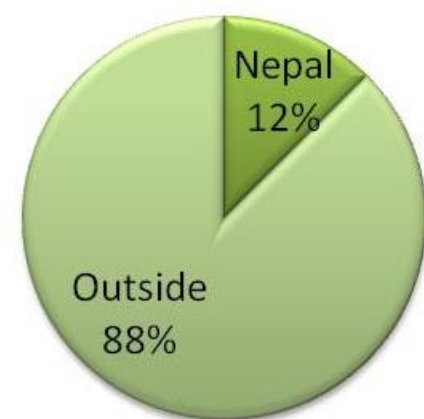
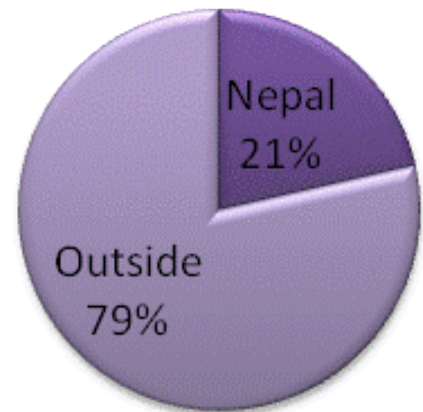
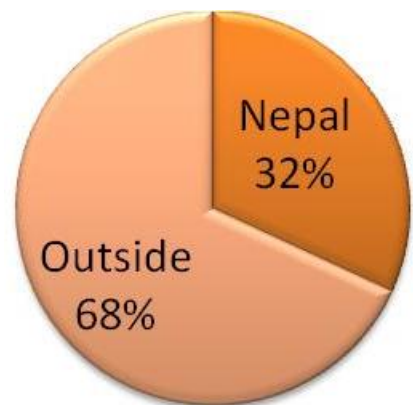
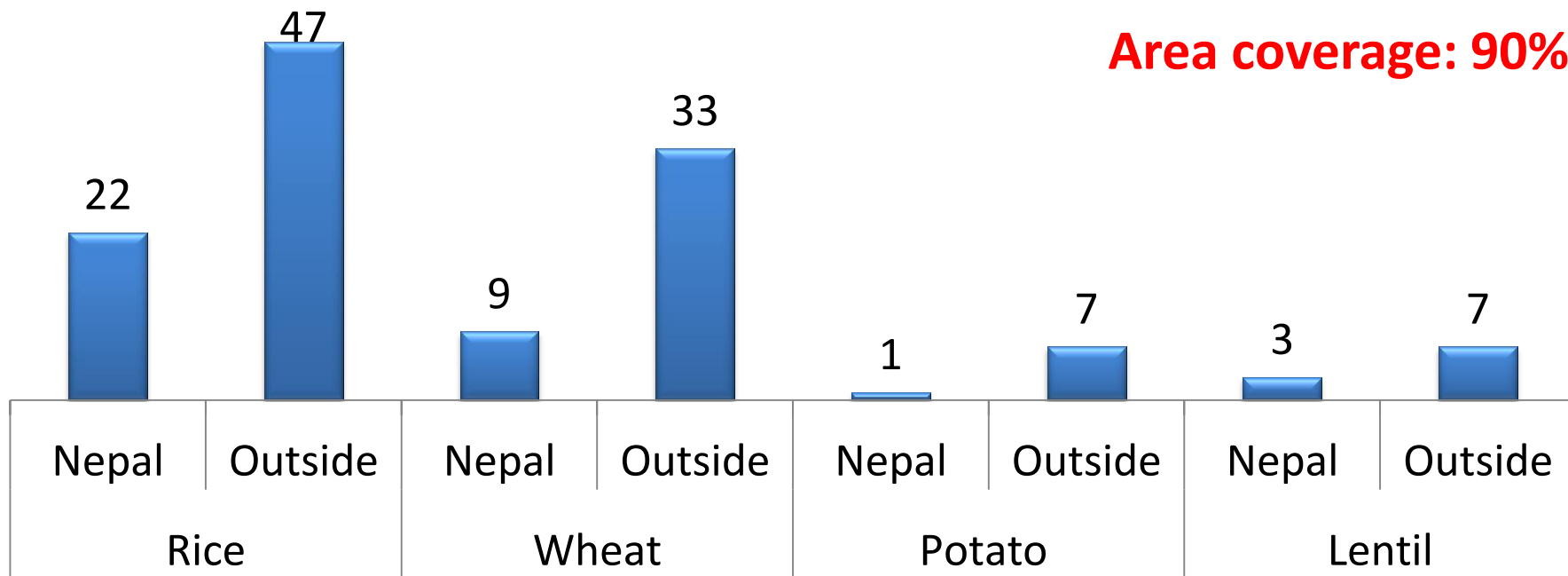


Genebank, Nepal



Origin of Released Varieties of 4 Selected Crops

Area coverage: 90%





BKJ

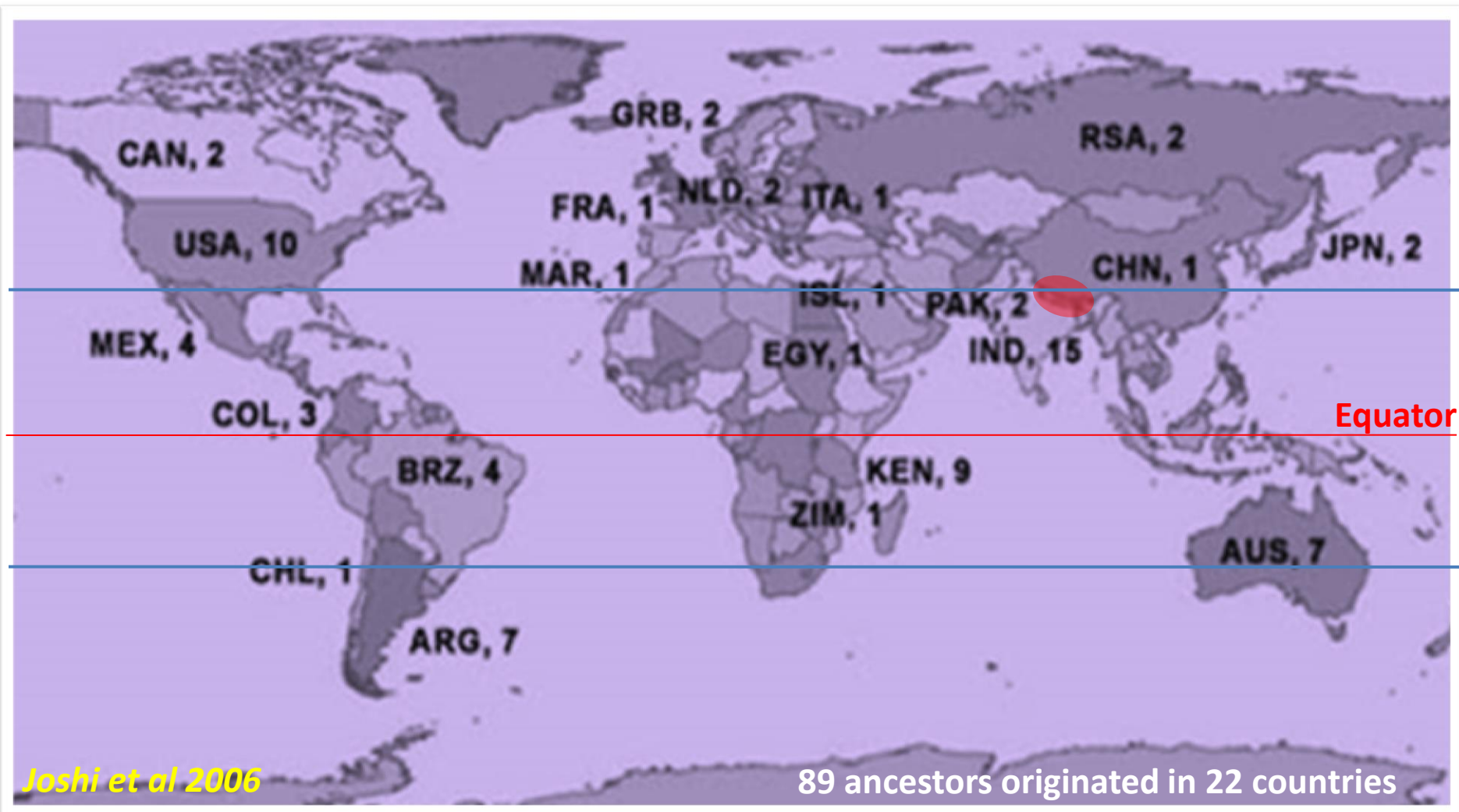


Genebank, Nepal



Origin of Ancestors of Wheat Varieties Released in Nepal

Based on 35 varieties





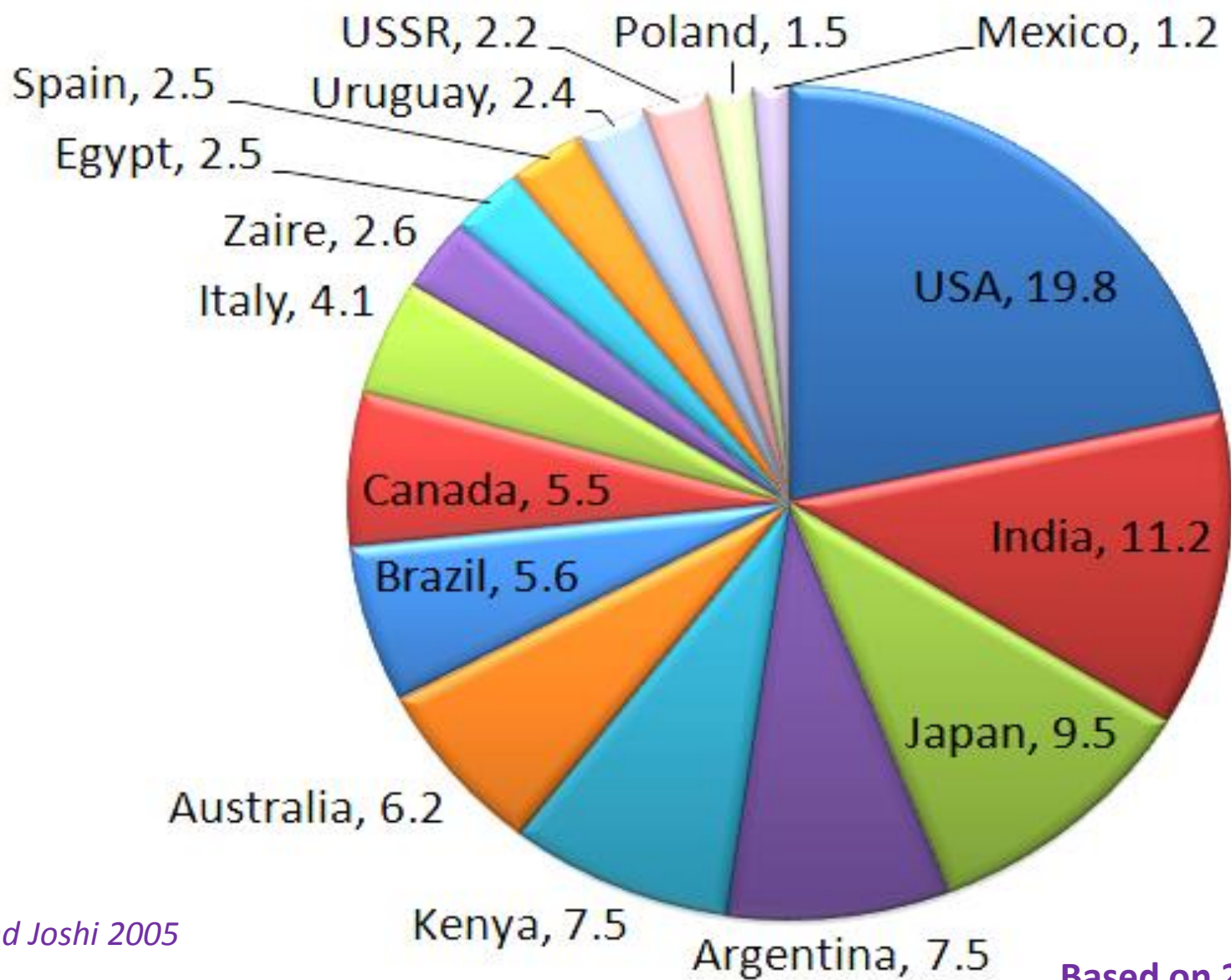
BKJ



Genebank, Nepal



Country-wise Cumulative Contribution of Ancestors to Nepalese Wheat Varieties



Rosyara and Joshi 2005

13/20

Based on 24 varieties

Contribution of Crop Gene Pools: Pedigree Analysis

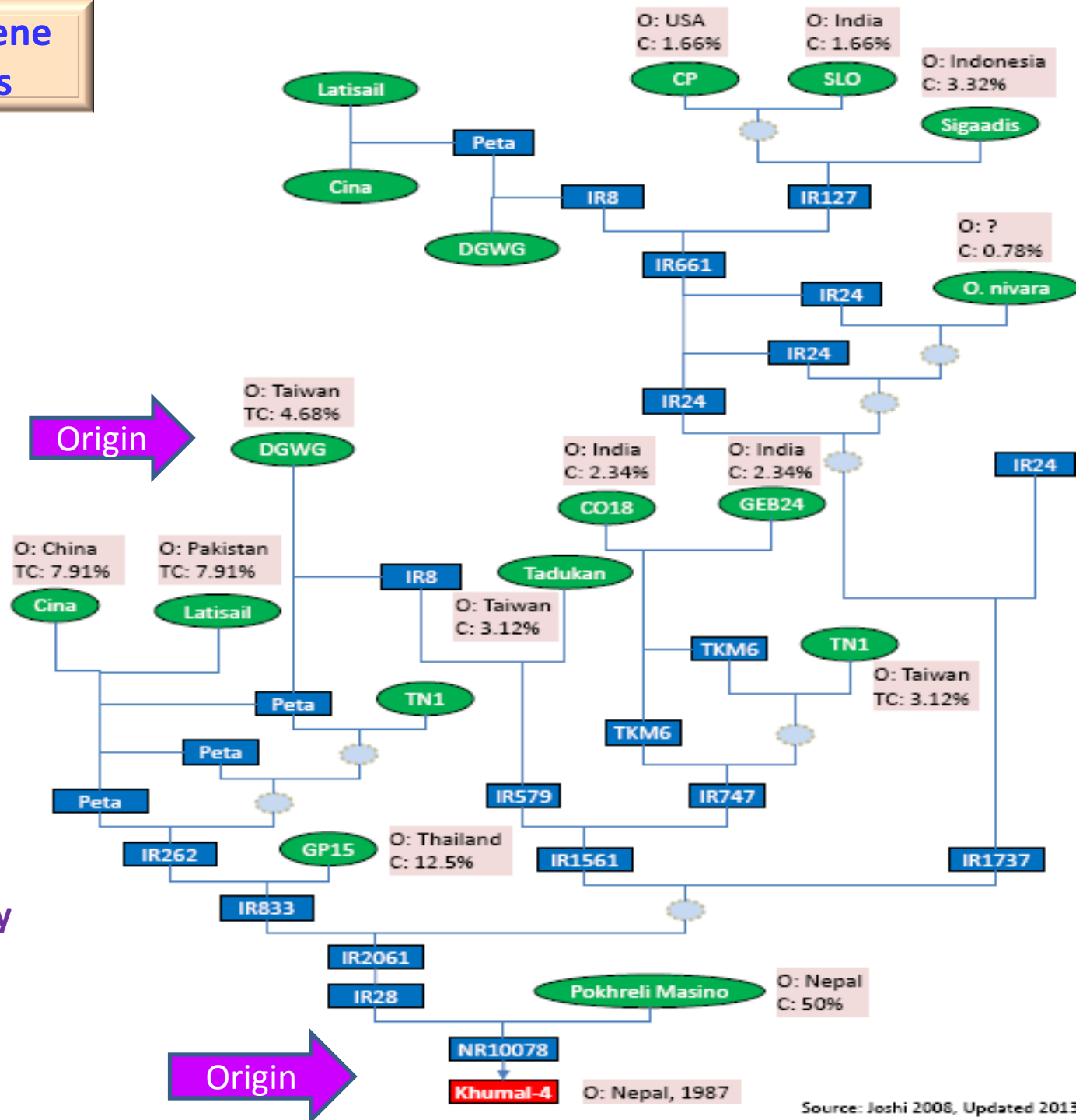
8 countries

1. USA
2. India
3. Indonesia
4. Taiwan
5. China
6. Pakistan
7. Thailand
8. Nepal

13 landraces

Source of genetic diversity

- Wild gene pool
- Cultivated gene pool
- Weed races





BKJ

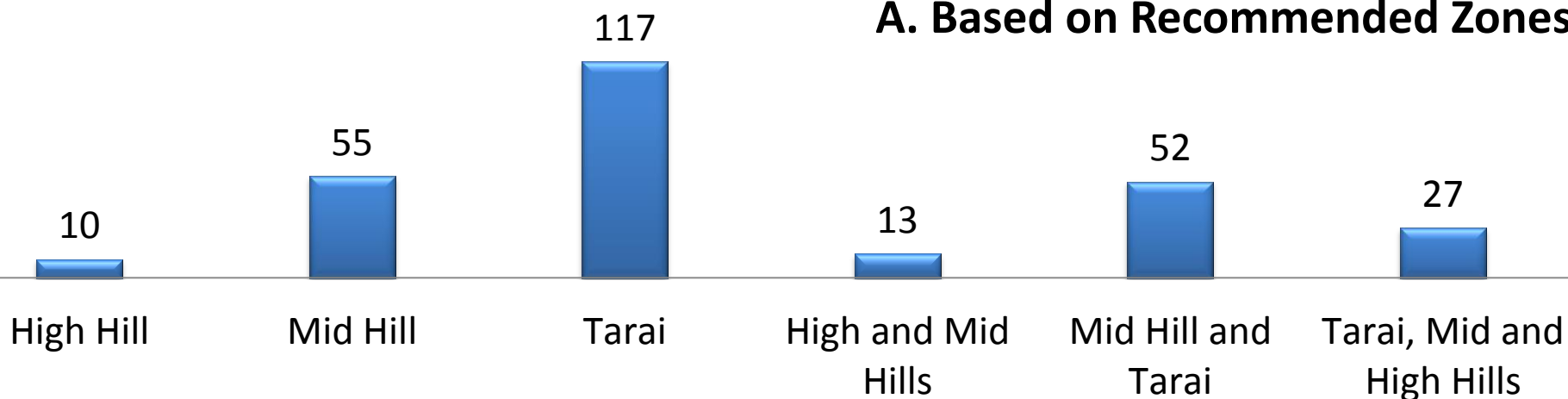


Genebank, Nepal

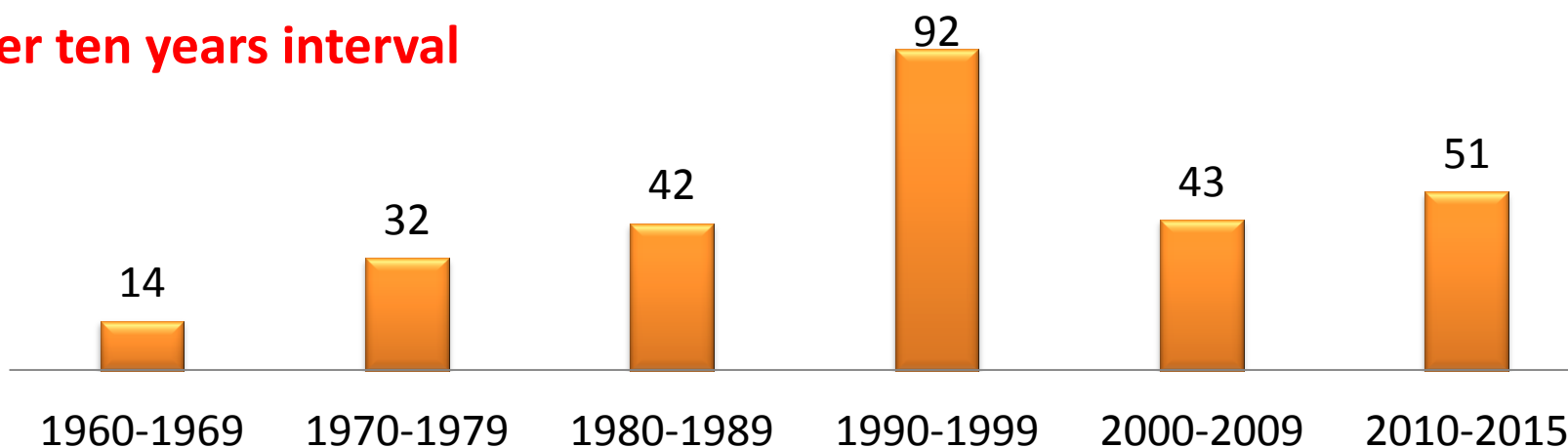


Released Varieties (Agroecozones and 10 years interval based)

A. Based on Recommended Zones



B Over ten years interval





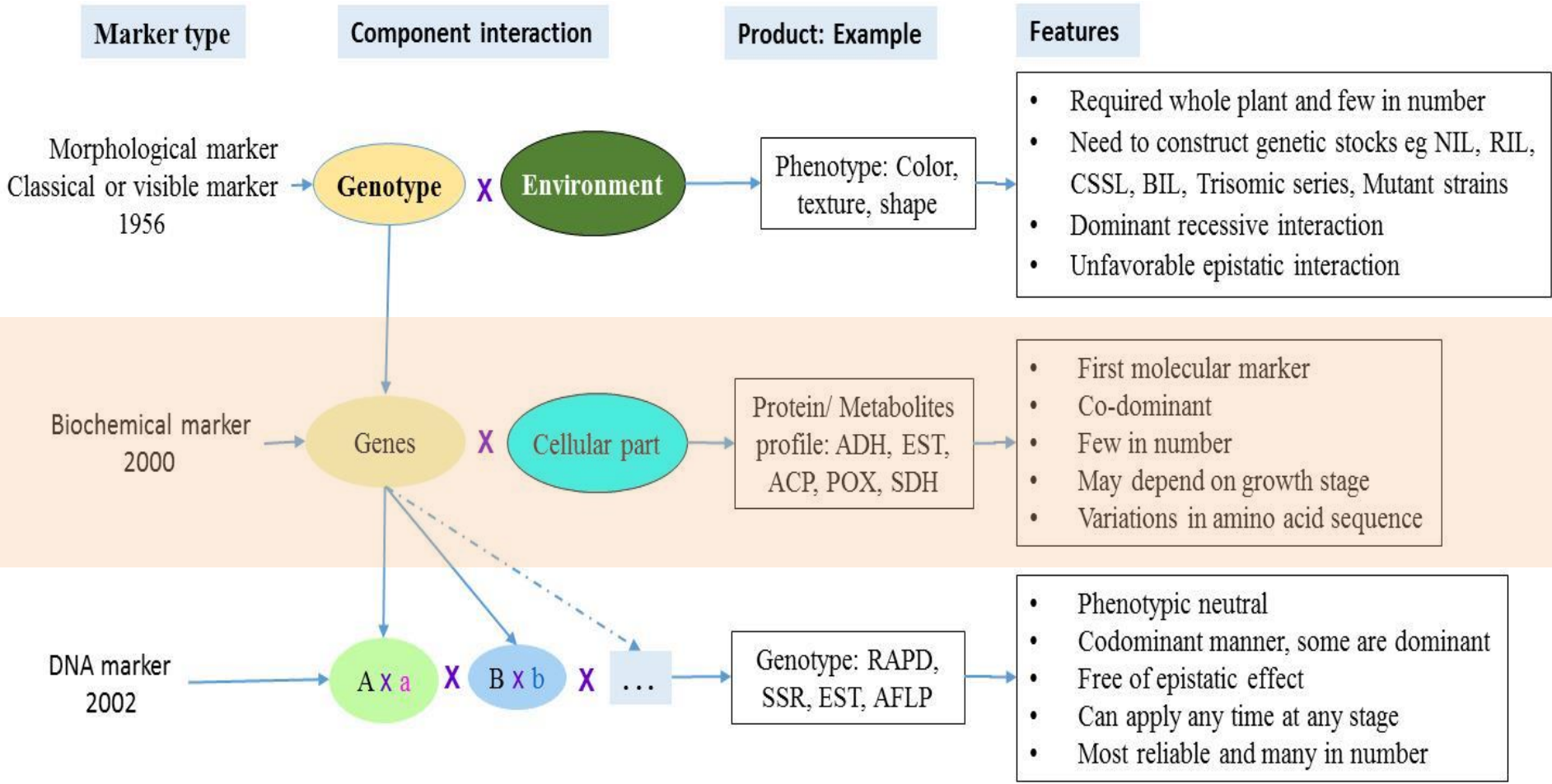
BKJ



Genebank, Nepal



Markers system used in plant breeding in Nepal





BKJ



Genebank, Nepal



Major Issues

- Genetics information of local crop landraces: Poorly documented
- Foundation of breeding for many crop species not established
- Hybridization in very limited crops and low in number
- Low priority for site specific varieties and heterosis breeding
- Advanced tools eg biotechnological tools, GIS, CAT, genomics and biometrics poorly applied
- Accessioning system not adopted (researched genotypes not available forever)



BKJ



Genebank, Nepal



Can we Answers?

- Number of plant geneticists and breeders?
- Contribution of plant breeding on productivity, food and nutrition security, commercial agriculture?
- Investment on plant breeding?
- Plant breeding in private sectors?
- People engagement in plant breeding?



BKJ



Genebank, Nepal



Acknowledgments

- MP Upadhyay
- Ashok Mudwari
- Kamlesh L. Rajbhandry
- Bal B. Shahi
- Madan R. Bhatta
- Bimal K. Baniya
- Agriculture Botany Division, NARC

