

## Seed Tracing and Traceability

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### Seed Tracing

Seed tracing can be used to map the flow of seed within a seed system and to gain insights about how seed growers, seed multipliers and variety developers diffuse seeds and named varieties. Seed tracing can examine the flow of information, money, ideas, or pests and diseases that might hitchhike on the exchanged seed.

#### A seed tracing study usually consists of 3 steps:

1. Development of the study design
2. Data collection
3. Data analysis

A network analysis looks at relationships and it has applications in many disciplines such as sociology, biology and economics. The relationships analyzed can be between multiple actors or types of actors such as people, farms, companies, animals, plants or institutes. The main relationships analyzed in a seed network are seed transactions, mapping the flow of planting material from one actor to another. The data set can also form the basis of an Impact Network Analysis (INA): it forms the minimum data set, which involves modelling about the flow of seed, diseases, or information through the system. Network data usually consist of nodes and edges. In a seed network analysis, the nodes represent actors who exchange seed or knowledge about it. The transactions between them form the edges. Depending on the research question, a range of information on the nodes and edges can be collected. Node information can be the types of actors, their location, demographic information, etc. Edge information can be the varieties and quantities of seed shared, data of the transaction, etc.

#### Benefits of seed mapping

- Mapping the seed flows helps to understand germplasm distribution, conservation, and the spread of seed borne pathogens in a seed system.
- A network analysis highlights social dimensions of a seed system.

- It can also reveal which farmers have better access to formal seed. When tracing seed data can be collected on transactions between actors, including volumes, quality and prices.
- The transactions form the links in the network analysis and the nodes represent the actors, such as breeders, seed multipliers and farmers. Gender, wealth, location and other information can be collected from these actors, depending on the research question.

### **Seed Traceability**

The traceability of seed certified by two agencies with help of the QR code will include information on who, when and where the seed is produced, date of expiry, when and where the seed is processed and packaged.

### **How does it functions**

- It is simple software which can be used by farmers using a smart phone.
- Upon scanning the QR code, the farmers can assess and learn about the quality and genuinity of seeds.
- The QR Codes can be printed and displayed anywhere on the containers and labels.
- Once the QR code is scanned, all the details about the seeds, including the place of manufacture, time and manufacturer details, processing and packing locations, seed quality tests results, tests date and expiry details are flashed on the screen immediately.

### **Benefits of seed traceability**

- It would be helpful for farmers to check the genuineness of seed production, seed quality can be verified, seed generation chain in seed production or multiplication can be established.
- Misuse of seed tags and misbranding of seeds can be avoided through this software,
- After checking all the details, farmers will be confident enough to purchase QR coded seed bags compared to the conventional ones, which lack these tags. helpful in exporting the seeds as well.
- It improves the credibility of manufacturers and value addition for seeds in the market and farmers can purchase genuine seeds.

- For law enforcement authorities the software helps in different ways as they can check on-spot information on seed genuinity and initiate stringent action against offender.

**Traceability of Seed**

