

Custom Hiring Services for Sustainable Agricultural Mechanization

By

Gajendra Singh
Email: prof.gsingh@gmail.com

Need for Mechanization

Use of labor in agriculture is not uniform through out the year. Use of equipment is also seasonal.

- 1. Shortage of labor during peak periods**
- 2. Unreliability of available labor**
- 3. Inability of animate power sources (human and draft animals) to complete operations within optimum period resulting in losses in yield or produce.**

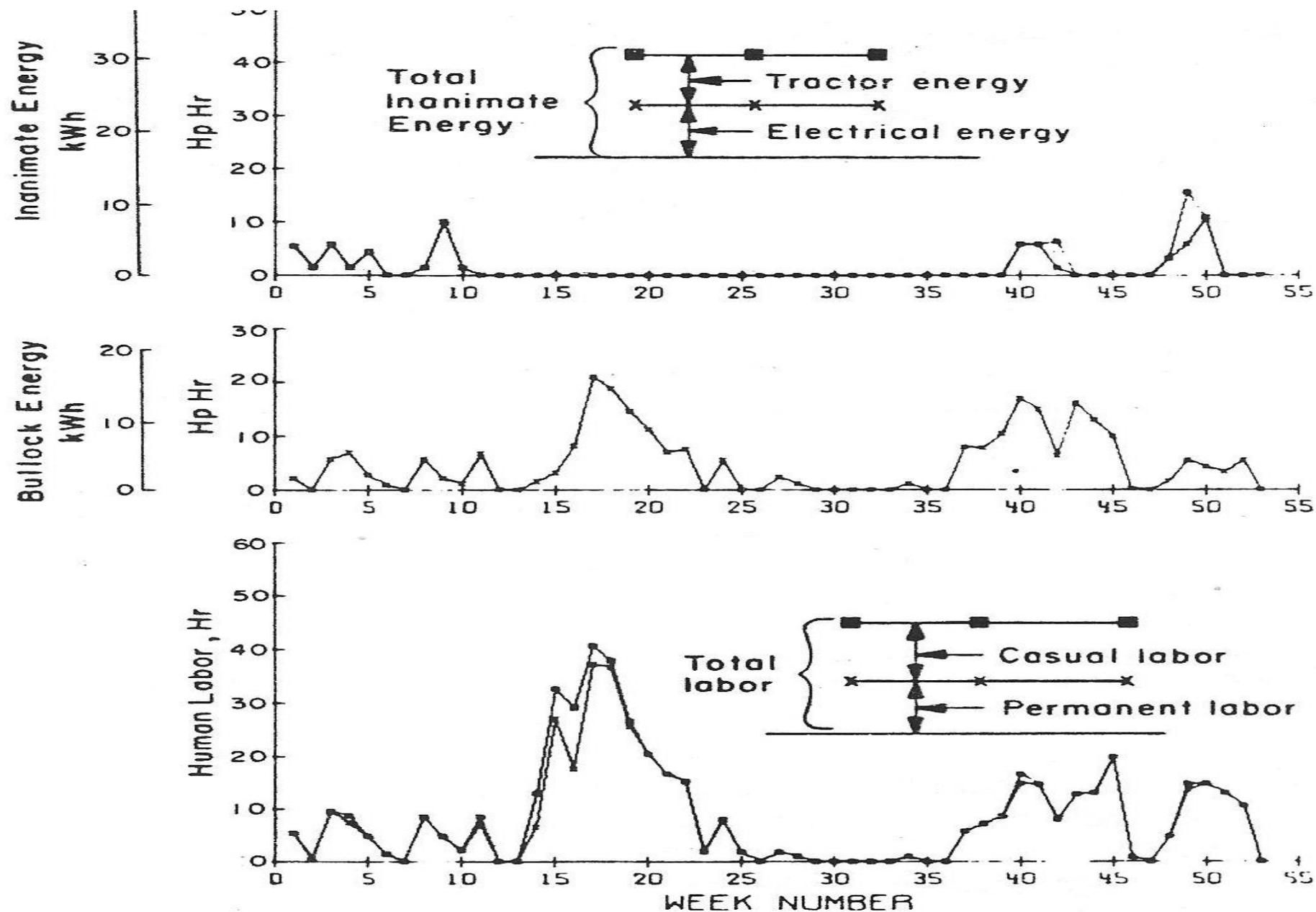


FIG. 4 Weekly energy inputs per acre [0.405 ha] for the high-yielding wheat varieties as grown by farms in category 2 [human and animal power used for field operations and for irrigation by Persian wheels]. Week 0 begins on January 1.

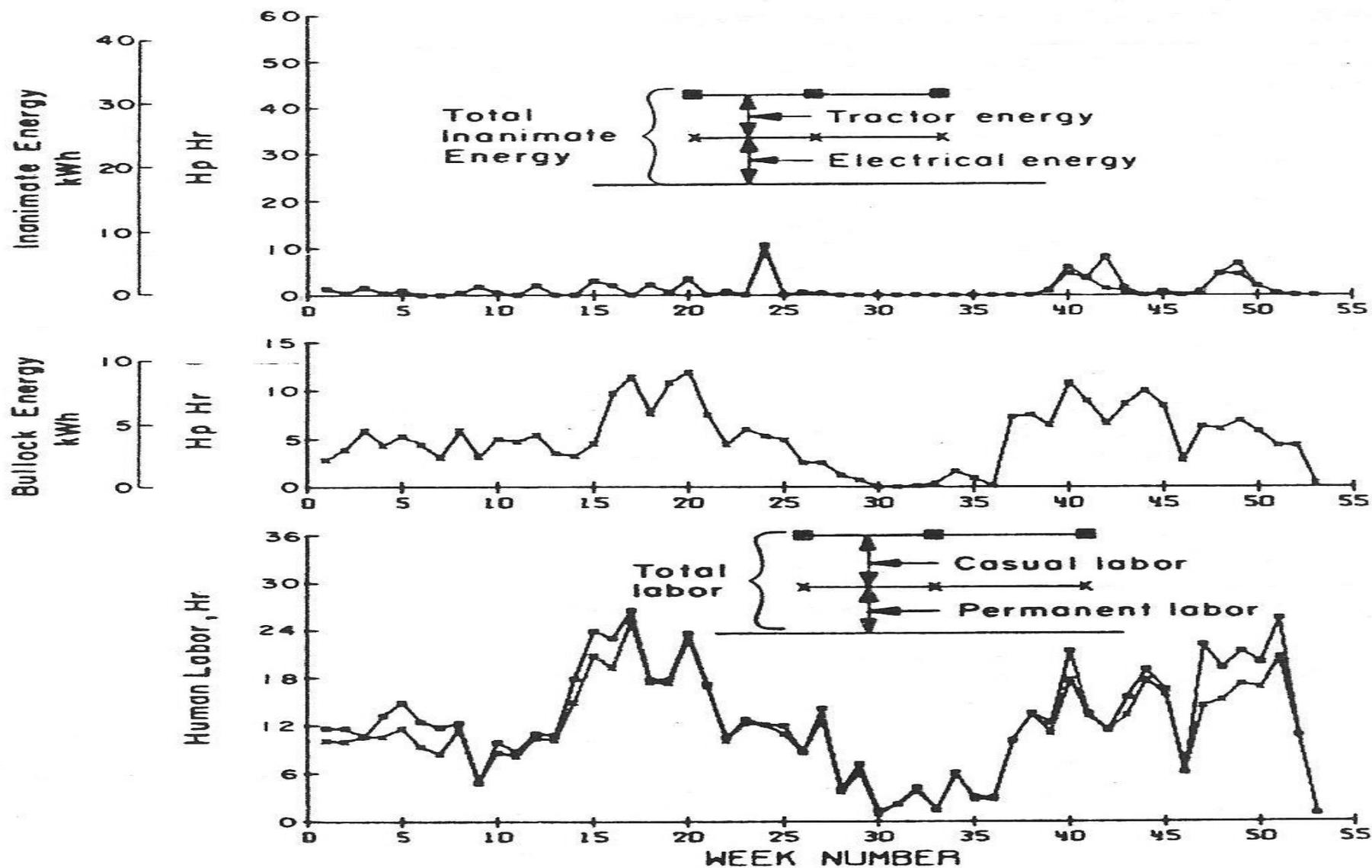


FIG. 2 Weekly energy inputs per acre [0.405 ha] by farms in category 2 [land irrigated by animal power using Persian wheels and farmed using only man and animal power]. Values shown for inanimate energy represent hired-in pumping or tractor services. Week 0 begins on January 1.

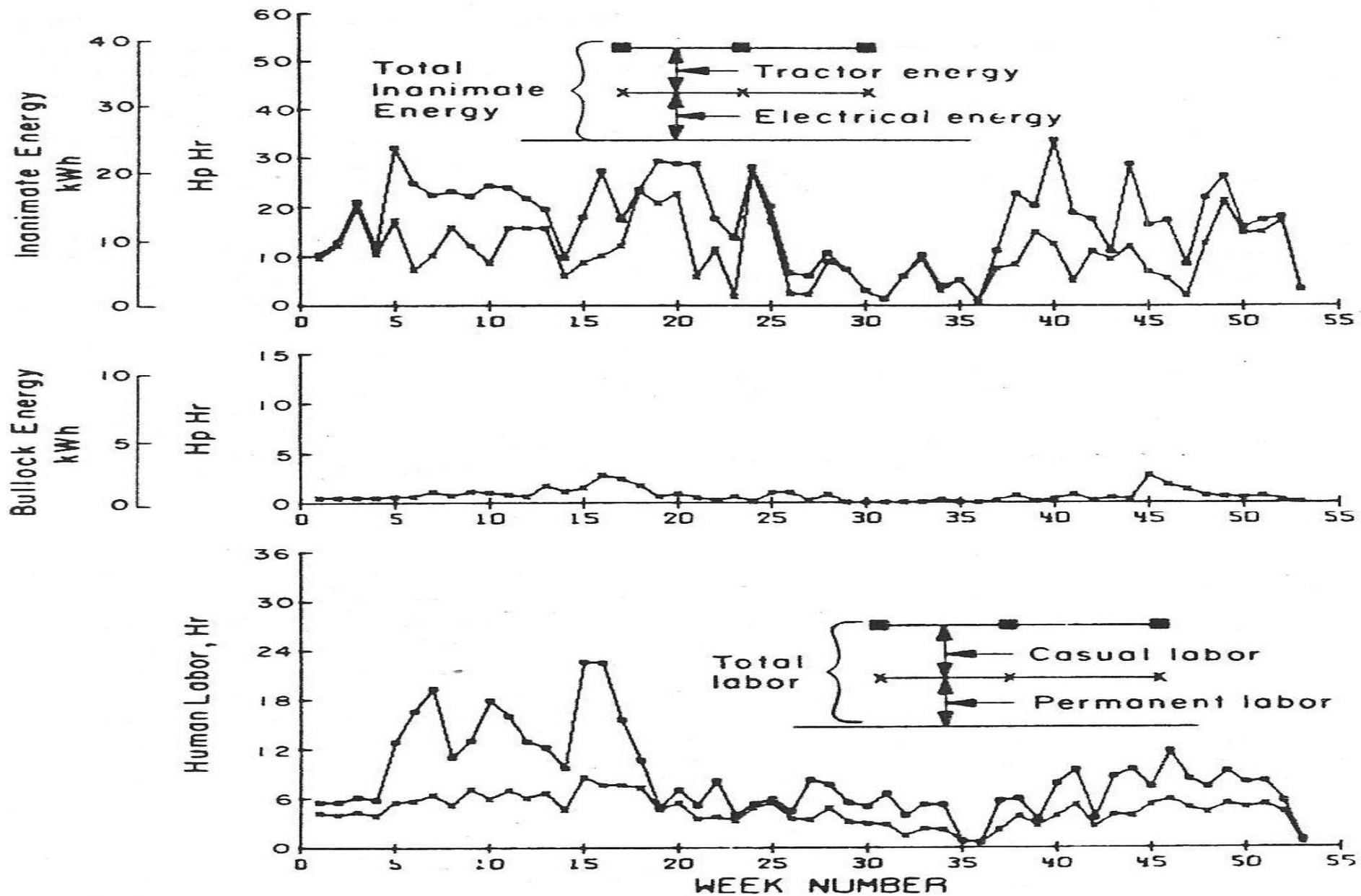


FIG. 3 Weekly energy inputs per acre [0.405 ha] by farms in category 6 [electricity used for irrigation pumping and farmstead processing; tractors used for field and transport operations]. Week 0 begins on January 1.

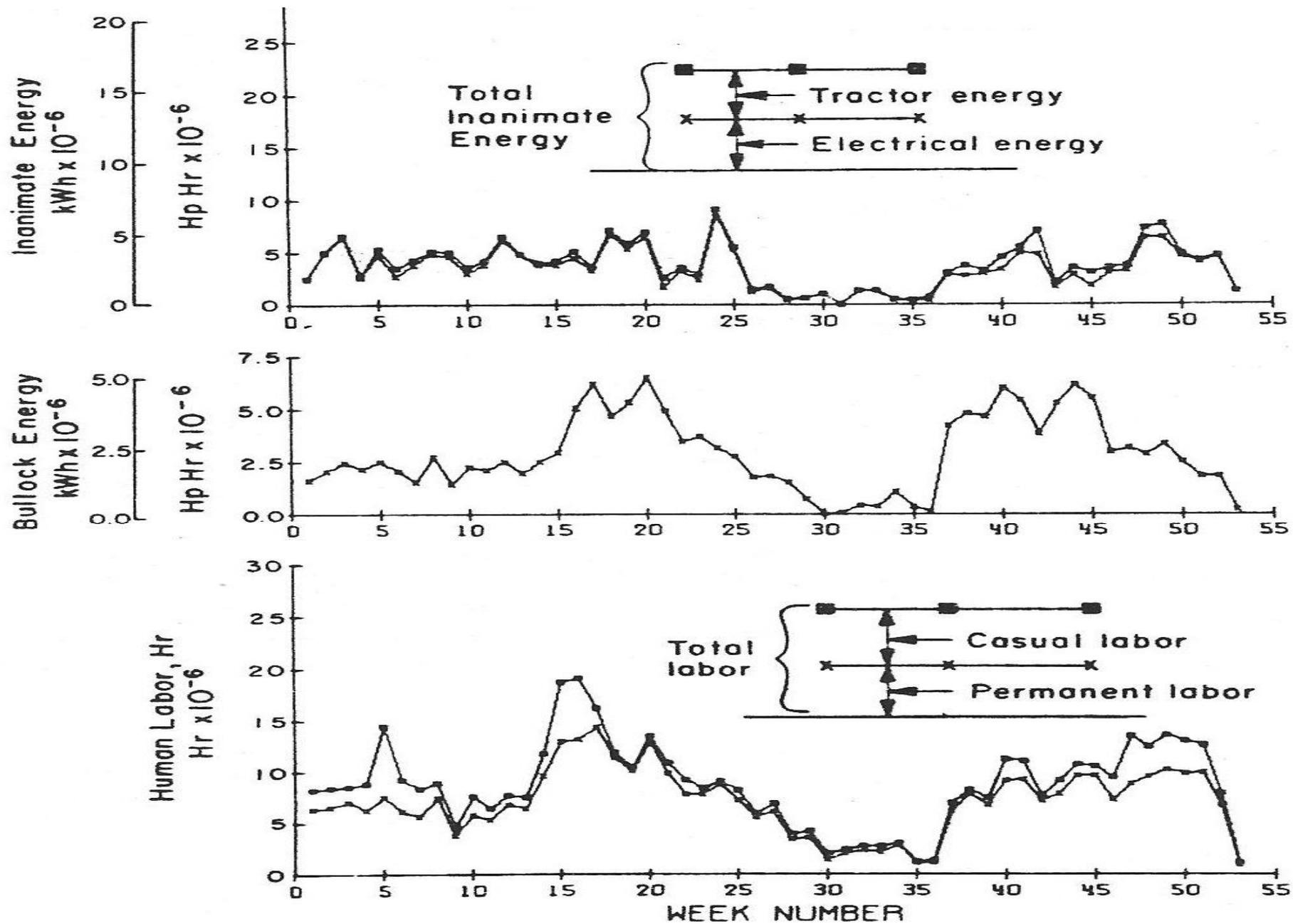


FIG. 5 Estimated weekly use of various energy inputs for agriculture in Meerut District during 1971-72. Week 0 begins on January 1.

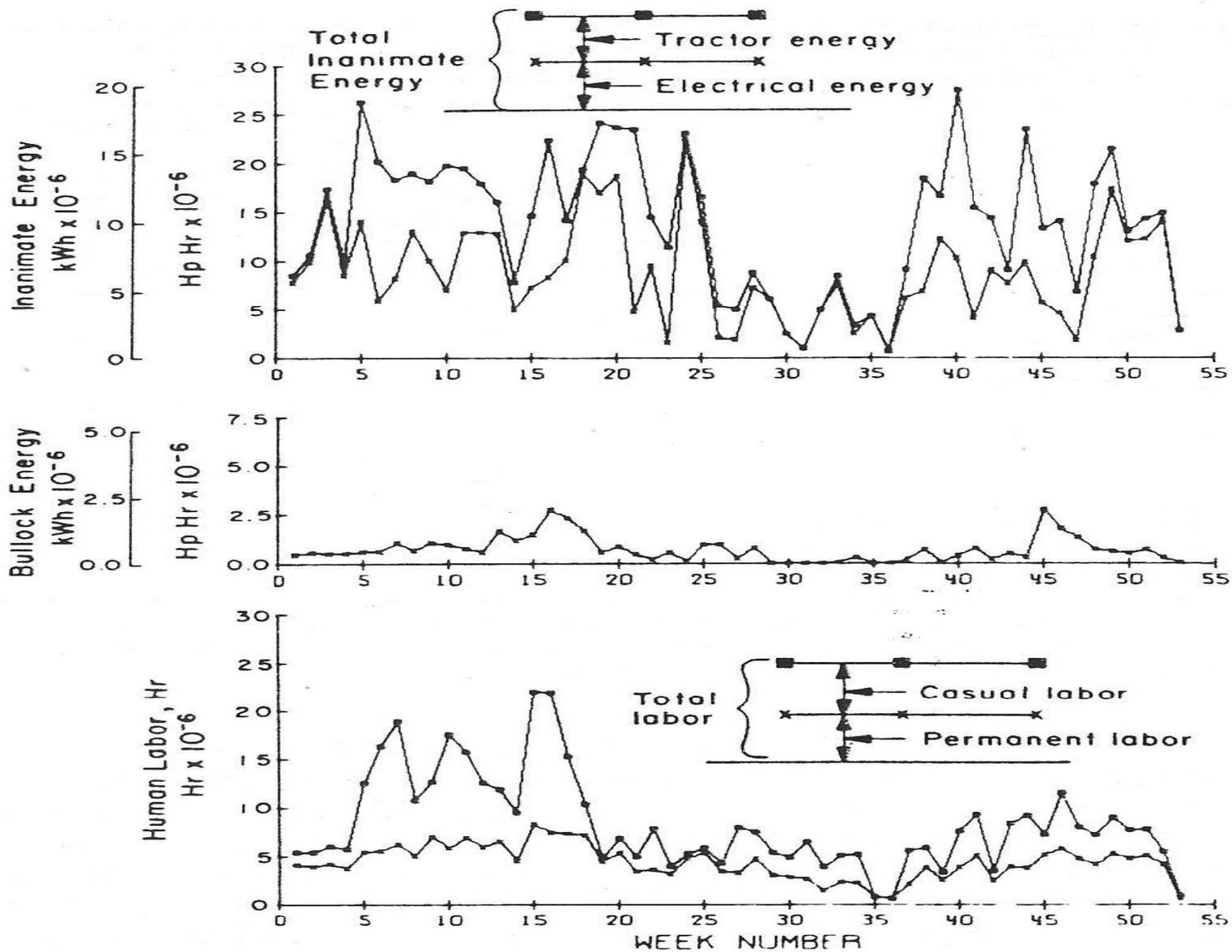


FIG. 6 Estimated weekly use of various energy inputs for agriculture in Meerut District for Distribution 3, in which all farms would be assumed to operate with category 6 mechanization level [electric power for irrigation and farmstead processing, and tractor power for field and transport operations]. Week 0 begins on January 1.

Unwillingness to work in agriculture

Drudgery

Harsh climate/environment

Long working hours

Farmer-worker relationship

Limited days of work in a year

Low annual income

The agriculture sector in developing countries in Asia and the Pacific region employs more people than in other sectors, industry and services. Contribution of agriculture to GDP is much smaller and thus average annual earnings of farm workers are much lower compared to workers in other sectors. For example, in India, agriculture employs about 50% labor force and its contribution to GDP is about 14% only. Thus the average annual earnings of non-agricultural workers are about 6 times that of agricultural workers. For China:5,Philippines:4, Thailand:6.

Sequence of Mechanization of Different Operations

Sequence	Operation		
Type of Operation	I High power Low skill / Low control	II Low-Medium Power Medium Skill / Medium control	III Low - High Power High Skill / Intensive control
Stationary	Grinding, milling, crushing, water pumping, threshing	Grinding by size, cleaning	Grinding by quality
Mobile	Land preparation, Transport	Seeding of grain, Harvesting of grain	Transplanting, Harvesting of cotton, Sugarcane, Fruits and Vegetables

Initially the ownership of machinery was with big farms/farmers and they provided very little custom hire services. With shortage of labor many medium farmers owned machines for their own work and custom hired these machines to other farmers. Now in most countries custom hire services are being provided by the entrepreneurs, both farmers and non-farmers. The size of machines owned by service providers is relatively larger compared to those owned by farmers for their own work. Many enterprises providing custom hire services own multiple sets of various machines.

Examples:

In China Combine Service Enterprises(CSEs) in 2011 were operating in 12 provinces.

They shifted from Chinese Futian combines to more reliable Japanese Kubota combines. CSEs have evolved in small co-operatives of 5-10 CSEs for maintenance and coordination.

Combines are upto 8 months away from home.

In India combine service providers travel upto 600 kms over a period of 2 months to harvest mainly wheat crop.

Common custom hire services

- Transportation:** 4WT and 2WT trailer: all countries;
animal carts: Nepal, Cambodia, Laos
- Milling:** Engine and motor: all countries
- Water pumping:** Engine, motor, 2WT pump: most countries
- Threshing (Wheat):** 4WT thresher: India, China, Pakistan, Nepal
- Threshing (Rice):** 4WT and 2WT thresher: most countries;
Diesel engines: Thailand
- Harvesting (Wheat):** Combine harvester: China, India, Pakistan
- Harvesting (Rice):** Combine harvester: China, Malaysia, India, Thailand, Sri Lanka

Common custom hire services

Tillage (Dry): 4WT: most countries

Tillage (Wet): 2WT: most countries

**Land leveling: 4WT laser leveler: India,
Pakistan, Cambodia**

**Seeding: 4WT seed drill: China, India,
Pakistan**

Transplanting (Rice): China, India

Maize shelling: India, Bangladesh

Harvesting (Sugarcane): Thailand, India

CONCLUDING REMARKS

In Asia and the Pacific region availability of competitive custom hire services is essential for mechanization of small farms to be productive and profitable.

For sustainable agricultural mechanization the governments should develop policies to strengthen custom hire services provided by individuals and enterprises.

Thank you