

The Impact of Custom Hiring Centre among Tribal Farmers of Arunachal Pradesh under NICRA Project

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INTRODUCTION

NICRA is a network project of the Indian Council of Agriculture Research (ICAR) launched in February; 2011. The project aims to enhance resilience against climatic vulnerability and climate change through strategic research and technology demonstration. Prominent output of the project is selection of promising crop genotypes and livestock breeds with greater tolerance to climate stress; Existing best practices for climate resilient demonstrated in 100 vulnerable districts of the country. The Infrastructure at key research institutes for climate change research strengthen adequately trained scientific manpower to take up climate change research in the country and empowered farmers to cope with climate variability with the outcome to enhanced resilience of agricultural production in vulnerable region of the country. The NICRA cover four modules under technology demonstration component are:

Module I: Natural resources : This module consist of interventions related to *in-situ* moisture conservation, water harvesting and recycling for supplemental irrigation, improved drainage in flood prone areas, conservation tillage where appropriate, artificial ground water recharge and water saving irrigation methods.

Module II: Crop production : This module consist of introducing draught/ temperature tolerant varieties, advancement of planting dates of *Rabi* crops in areas with terminal heat stress, water saving paddy cultivation methods (SRI, direct seeding), frost management in horticulture through fumigation, community nurseries for delayed monsoon, custom hiring centre for timely planting, location specific intercropping system with high sustainable yield index.

Module III: Livestock and fisheries : Use of community lands for fodder production during draught / floods, improved fodder/feed storage methods, preventing vaccination, improved shelters for reducing heat stress in livestock, management of fish pond/tanks during water scarcity and excess water, etc.

Module IV: Institutional intervention : This module consist of either of institutional interventions either by strengthening the existing one or initiating new ones relating to seed bank, commodity groups, custom hiring centre, collective marketing, introduction of weather index based insurance and climate literacy through a village level weather station.

About the village : KVK, Tirap has been implementing the project in Sipini ADC village; a 100 per cent ST populated village of the Tirap district of Arunachal Pradesh. It is one of the drought prone ADC villages of Tirap district. The cropping system is mainly rice based and purely rainfed. Water scarcity and unavailability of irrigation facility force farmers towards practice of *Jhumming*; which leads to high rate of soil erosion.

Table No.1. Village details -

| Name of the village | Sipini |
|-------------------------------------|---|
| District | Tirap |
| State | Arunachal Pradesh |
| Total no of household | 66 |
| Total Population | 318 |
| Soil details | Sandy soil |
| Average rainfall | 2200 mm |
| Major crops | Paddy, millet, colocassia, maize, tapioca, French bean, garden pea, seasonal vegetables |
| Climate vulnerability | Extreme rain during summer, dry during winter |
| Latitude | 26 ⁰ 38' N & 27 ⁰ 47' N |
| Longitude | 96 ⁰ 16' E & 95 ⁰ 40' E |
| Agro climatic zone | Eastern Himalayan Region (Zone II) Sub region-: Per Humid Hyper thermic Foothills |
| Total cultivated area (ha) | 148 |
| Rain fed area(ha) | 122 |
| Irrigated area(ha) | 26 |
| Major climate variability challenge | Heavy rainfall and soil erosion during rainy season and Poor soil moisture during rabi season |
| Source of irrigation | Jalkund |

Table No: 2. Existing mechanization status in the Village

| Crop | Activities/operations | Existing practices |
|----------------------------|-----------------------|---|
| Paddy | Seed bed preparation | B.O /T.O MB plough, power tiller Sowing/planting |
| | Irrigation | Flood, furrow |
| | Weeding/intercultural | Hand tools |
| | Plant protection | Knap sack sprayer |
| | Harvesting | Sickle |
| | Threshing | Manual, bullock |
| | Seed bed preparation | B.O /T.O MB plough, power tiller Sowing/planting |
| Summer & winter vegetables | Seed bed preparation | Sowing/planting |
| | Irrigation | Weeding/intercultural |
| | Plant protection | Harvesting |
| | Seed bed preparation | Sowing/planting |
| | Irrigation | Weeding/intercultural |
| Potato | Seed bed preparation | Manual Irrigation |
| | Weeding interculture | Hand tools |
| | Plant protection | Knap sack sprayer |
| | Harvesting | Desi plough |
| | Seed bed preparation | Manal Irrigation |

Table No:3. Farm implements ; provided under NICRA

| Name of farm implements | Month & Year | Uses | |
|---------------------------------|--------------|-------------------|-----------------------------|
| | | Crop | Operation |
| Khurpi (25 nos.) | August, 2011 | Vegetables | Weeding, nursery bed making |
| Hand transplanter (25 nos.) | August, 2011 | Vegetables | Transplanting |
| Hand fork weeder/rake (25 nos.) | August, 2011 | Vegetables | Weeding |
| Cono weeder (8 nos.) | August, 2011 | Paddy | weeding |
| Digital balance (1 no.) | August, 2011 | All crops | weighing |
| Improved sickle (16 nos.) | Sept, 2011 | Paddy | harvesting |
| Rake (2 nos.) | Sept, 2011 | Vegetables | Weed collection |
| Paddy paddle thresher | Sept, 2011 | Paddy | Threshing |
| Mini rice hauler | Sept, 2011 | Paddy | Milling |
| Sprayer (10 nos.) | Sept, 2011 | All crops | Spraying |
| Wheel hoe (1 no.) | Sept, 2011 | Pulses | Weeding |
| Weed cutter (1 no.) | Sept, 2011 | Vegetables | Cutting |
| Water cane (25 nos.) | Sept, 2011 | Vegetables | Irrigation |
| Power tiller (1 no.) | Sept, 2011 | All crops | Ploughing |
| Pump set (2 nos.) | Sept, 2011 | Paddy, Vegetables | Irrigation |

Table No: 4. Utilization details of farm implements

| S.N. | Name of farm implements | Crop | Operation | Charges | Annual Use |
|------|-------------------------|-------------------|-----------------------------|-----------------|------------|
| | | | | Rs./hour or day | |
| 1 | Khurpi | Vegetables | Weeding, nursery bed making | 2/day | - |
| 2 | Hand transplanter | Vegetables | Transplanting | 30/day | - |
| 3 | Hand fork weeder/rake | Vegetables | Weeding | 10/day | - |
| 4 | Cono weeder | Paddy | weeding | 10/day | - |
| 5 | Digital balance | All crops | weighing | 2/day | - |
| 6 | Improved sickle | Paddy | harvesting | 3/day | - |
| 7 | Paddy paddle thresher | Paddy | Threshing | 30/day | 32 day |
| 8 | Mini rice hauler | Paddy | Milling | 200/day | 40 day |
| 9 | Rake | Vegetables | Weed collection | 3/day | - |
| 10 | Sprayer | All crops | Spraying | 20/day | 22 days |
| 11 | Wheel hoe | Pulses | Weeding | 10/day | 19 days |
| 12 | Weed cutter | Vegetables | Cutting | 2/day | 44 days |
| 13 | Water cane | Vegetables | Irrigation | 2/day | 27 days |
| 14 | Power tiller | All crops | Ploughing | 100/h | 87 days |
| 15 | Pump set | Paddy, Vegetables | Irrigation | 100/h | 126 Hours |

Village Scenario:

Custom hiring centre under NICRA project :

Custom hiring committee: A custom hiring committee was formed for smooth running of the centre under village climate risk management committee (VCRMC) of NICRA project at project site.

Machinery received under NICRA : Different machinaries under CHC are as follows:-

Hiring charges of implements: Rate was fixed by the members of Village Climate Risk Management Committee on the basis of capacity of the farmers to borrow and ability to adopt the equipments.

Table No: 5. Data on no. of farmers benefited and area covered by Farm implements

| S.N. | Name of farm implements | Year | No of farmers benefited | Area covered (ha) |
|------|-------------------------|---------|-------------------------|-------------------|
| 1 | Khurpi | 2011-12 | 62 | 1.5 |
| | | 2012-13 | 47 | 2.4 |
| | | 2013-14 | 89 | 1.8 |
| | | 2014-15 | 53 | 3.3 |
| | | 2015-16 | 40 | 2.6 |
| | | 2016-17 | 82 | 1.9 |
| | | 2017-18 | 76 | 2.4 |
| 2 | Hand transplanter | 2011-12 | 16 | 20 |
| | | 2012-13 | 27 | 14 |
| | | 2013-14 | 20 | 26 |
| | | 2014-15 | 28 | 26 |
| | | 2015-16 | 35 | 11 |
| | | 2016-17 | 21 | 08 |
| | | 2017-18 | 19 | 13 |
| 3 | Hand fork weeder/rake | 2011-12 | 47 | 2.3 |
| | | 2012-13 | 54 | 3.5 |
| | | 2013-14 | 38 | 2.8 |
| | | 2014-15 | 60 | 4.7 |
| | | 2015-16 | 32 | 1.6 |
| | | 2016-17 | 28 | 2.4 |
| | | 2017-18 | 59 | 4.9 |
| 4 | Cono weeder | 2011-12 | 64 | 33 |
| | | 2012-13 | 76 | 38 |
| | | 2013-14 | 58 | 29 |
| | | 2014-15 | 44 | 25 |
| | | 2015-16 | 38 | 20 |
| | | 2016-17 | 49 | 26 |
| | | 2017-18 | 41 | 19 |
| 5 | Digital balance | 2011-12 | 36 | 36 |
| | | 2012-13 | 45 | 43 |
| | | 2013-14 | 26 | 28 |
| | | 2014-15 | 39 | 40 |
| | | 2015-16 | 42 | 46 |
| | | 2016-17 | 27 | 26 |
| | | 2017-18 | 32 | 29 |
| 6 | Improved sickle | 2011-12 | 20 | 22 |
| | | 2012-13 | 28 | 30 |
| | | 2013-14 | 36 | 39 |
| | | 2014-15 | 21 | 23 |
| | | 2015-16 | 42 | 41 |
| | | 2016-17 | 39 | 36 |
| | | 2017-18 | 40 | 40 |
| 7 | Rake | 2011-12 | 08 | 0.5 |
| | | 2012-13 | 14 | 08 |
| | | 2013-14 | 16 | 09 |
| | | 2014-15 | 21 | 12 |
| | | 2015-16 | 19 | 12 |
| | | 2016-17 | 16 | 08 |
| | | 2017-18 | 26 | 14 |
| 8 | Sprayer | 2011-12 | 20 | 22 |
| | | 2012-13 | 26 | 25 |
| | | 2013-14 | 18 | 18 |
| | | 2014-15 | 16 | 17 |
| | | 2015-16 | 24 | 24 |
| | | 2016-17 | 28 | 28 |
| | | 2017-18 | 32 | 32 |

| | | | | |
|----|--------------|---------|----|-----|
| 9 | Wheel hoe | 2011-12 | 06 | 0.4 |
| | | 2012-13 | 10 | 5.2 |
| | | 2013-14 | 22 | 12 |
| | | 2014-15 | 27 | 14 |
| | | 2015-16 | 18 | 9 |
| | | 2016-17 | 24 | 10 |
| | | 2017-18 | 17 | 08 |
| 10 | Weed cutter | 2011-12 | 33 | 4.7 |
| | | 2012-13 | 20 | 6.2 |
| | | 2013-14 | 19 | 3.8 |
| | | 2014-15 | 28 | 6.4 |
| | | 2015-16 | 22 | 3.9 |
| | | 2016-17 | 17 | 3.6 |
| | | 2017-18 | 29 | 7.6 |
| 11 | Water cane | 2011-12 | 33 | 0.6 |
| | | 2012-13 | 46 | 1.2 |
| | | 2013-14 | 28 | 0.2 |
| | | 2014-15 | 45 | 0.8 |
| | | 2015-16 | 20 | 0.2 |
| | | 2016-17 | 39 | 0.7 |
| | | 2017-18 | 40 | 0.6 |
| 12 | Power tiller | 2011-12 | 06 | 06 |
| | | 2012-13 | 10 | 10 |
| | | 2013-14 | 12 | 14 |
| | | 2014-15 | 15 | 17 |
| | | 2015-16 | 18 | 20 |
| | | 2016-17 | 22 | 22 |
| | | 2017-18 | 27 | 27 |
| 13 | Pump set | 2011-12 | 14 | 28 |
| | | 2012-13 | 18 | 26 |
| | | 2013-14 | 21 | 24 |
| | | 2014-15 | 18 | 14 |
| | | 2015-16 | 26 | 30 |
| | | 2016-17 | 19 | 22 |
| | | 2017-18 | 16 | 26 |

Impact :

Experiences of local people with CHC:

Acceptability of the CHC by the farmers is satisfactory. Farmers are very much happy with the CHC because after establishment of the centre they are able to follow timely sowing, weeding, inter-cultural operation, threshing and harvesting operation etc. CHC established in NICRA villages have provided many opportunities in dealing various weather duration during 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17 and 2017-18.

Constraints :

Wider adoption of custom hiring: Constraints in wider adoption of CHC were observed in five different heads; viz., technical, financial, social, institutional and Others. They are as

follows : --Demonstration on implements which save the other input like fertilizer or chemical

– More training and exposure are required to increase farmer's interest.

--Required more nos. of implements like power tiller, cono weeder, spray machine, pump set.

CONCLUSION

The KVK team concluded that there are a huge scope of more custom hiring centre in the Sipini ADC village. Due to undulating topography of the village; light machineries are more feasible than heavy machines, in such a scenario the more light machineries should be promoted. As winter season is dry, so water pump set should be provided for getting a very good irrigation facility in the village which can ultimately increase the cropping intensity. So,

this has proved that that although a great height have been achieved by CHC but there is a

more scope to make this facility available to each and every farmer of the Sipinivillage.



Photos of Custom Hiring Centre- Sipini Village,
Tirap district, Arunachal Pradesh